Ministry of Water Resources and Irrigation
US Agency for International Development
Agricultural Policy Reform Program
Environmental Policy and Institutional Strengthening Indefinite Quantity Contract

APRP—Water Policy Activity
Contract PCE-1-00-96-00002-00
Task Order 807

ANALYSIS AND REVIEW OF MODIFICATIONS IN LAW 12 OF 1984 ON IRRIGATION AND DRAINAGE

Report No. 37
Main Document

December 2000

Water Policy Program
International Resources Group **Winrock International** **Nile Consultants**

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December 2000

For
United States Agency for International Development/Egypt

Environmental Policy and Institutional Strengthening Indefinite Quantity Contract (EPIQ)
Partners: International Resources Group, Winrock International,
and Harvard Institute for International Development

Subcontractors: PADCO; Management Systems International; and Development Alternatives, Inc.

Collaborating Institutions: Center for Naval Analysis Corporation; Conservation International; KNB Engineering and Applied Sciences, Inc.; Keller-Bliesner Engineering; Resource Management International, Inc.; Tellus Institute; Urban Institute; and World Resources Institute

ACKNOWLEDGEMENTS

The water related responsibilities of the Ministry of Water Resources and Irrigation (MWRI) are spelled out in Law 12 / 1984 on Irrigation and Drainage. An amendment was made to Law 12 in 1994 (Law 213) to legalize the establishment of water users associations at the mesqa level. To render these laws more effective, they are to be reviewed in light of on-going changes in water management in Egypt.

This report has been prepared under the auspices of the Water Policy Advisory Unit (WPAU)/EPIQ program concerning benchmark C.5 of Tranche IV of the Water Policy Reform activity. The benchmark states that "The GOE (MWRI) will prepare revisions to Law 12/1984 on Irrigation and Drainage and its supplementary laws to improve effective water resources management".

The report supports the work of the task committee created by the Ministerial Decree of 1998 to revise articles of Law 12, recommend modifications and develop the law.

The WPAU/EPIQ Revision of Law 12/1984 Working Group prepared this report. Members of the group include Eng. Sarwat Fahmy, Eng. Nasser Ezzat, Dr. Ibrahim Elassiouty, Eng. Ahmed Maher and Dr. Mohamed Badran.

Special thanks to Eng. Gamil Mahmoud, Chairman of the MWRI Project Steering Committee and the MWRI Water Policy Advisory Unit; Dr. Craig Anderson, Coordinator for USAID Water Activities, Dr. Wadie Fahim, USAID Project Technical Officer; and Dr. Jeffrey Fredericks, EPIQ/WPRP Team Leader, for their leadership and support.

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EXECUTIVE SUMMARY

Introduction

Law 12/1984 and its supplementary Law 213/1994 define the use and management of public and private sector irrigation and drainage system structures; including main canals, feeders, and drains. They also provide legal direction for the use and maintenance of public and private canals, and specify arrangements for cost recovery in irrigation and drainage works. Law 12 regulates the use of groundwater and agricultural drainage water and legislates other factors such as protection against flooding, navigation and coastal protection. Penalties for violation of the laws and by- laws are also specified.

The supplementary Law 213 provides the Ministry of Water Resources and Irrigation (MWRI) with the legal foundation for involving landowners, at the mesqa and farm levels in irrigation system improvements. It also established a fund to finance projects related to the development and maintenance of improved mesqas and to promote water use awareness.

In light of prevailing and projected water supplies, demographic, and ecological conditions in Egypt, the laws are in serious need of reconsideration. Law 12 should be revised to take into account current GOE policies on liberalized crop choice and horizontal expansion of new lands. Implementation of this policy benchmark will significantly improve the ability of MWRI to maximize diminishing resources and to guide Egypt's water suppliers and water consumers into this millennium.

Scope of Work

Benchmark C.5 of APRP Tranche IV (1/7/99-12/31/2001) states that "The GOE (MWRI) will prepare revisions to Law 12/1984 on irrigation and drainage and its supplementary laws, to improve effective water resources management". This report has been prepared in support of this benchmark. The overall objective of the report is to give an analysis and review of the institutional and legal frameworks for water resources management in Egypt. Past and current water management policies are outlined, and new areas and concepts related to improved water management and use, as well as new relevant issues and policies, are identified. Changes and amendments are proposed and justified.

Need for Reviewing Law 12

Law 12/1984 was issued to provide a legal basis for irrigation and drainage issues based on the visions of the 1960's. Given the major changes in vision and policies, the increasing scarcity of water in Egypt, the anticipated diversion of Nile water to new lands, and the increased importance of stakeholder participation, the laws need to be carefully reviewed and revised.

Legislation Governing Water Resources

Table (1) provides an overview of water laws and water-related laws dealing with water resources and their management. Some of these laws need to be reviewed as some of their articles overlap or conflict with irrigation and drainage Law 12.

Table 1. Water Laws and Water Related Laws

LAW/YEAR	DEALS WITH	DESCRIPTION	IMPLEMENTING AGENCY
WATER LAWS			
Law 12/1984	Irrigation and drainage	Regulates the use of water, includes full recovery of sub- surface drainage costs by farmers.	Ministry of Water Resources and Irrigation (MWRI)
Law 93/1962	Drainage of liquid waste	Regulates the discharge of waste water into sewer systems and specifies standards for waste disposal to sewers and for use in irrigation.	Ministry of Housing and Utilities (MOHU)
Law 48/1982	Protection of the Nile River and Waterways	Classifies types of waterways and regulates the discharge of waste water into these waterways.	Ministry of Water Resources and Irrigation (MWRI) Ministry of Health and Population (MOHP)
Law 4/1992	Laws for the environment	Provides rules for protection of the environment, regulates air pollution; sets standards for industry.	Ministry of Environmental Affairs (MEA)
Law 213/1994	Legalizes WUAs	Legalizes WUAs at mesqas level and provides for recovery of capital cost for IIP.	Ministry of Water Resources and Irrigation (MWRI)
Law 27	Drinking water quality	Sets drinking water quality standards and regulates monitoring.	Ministry of Health and Population (MOHP)

Privatization			
Law 203/1991	**Public sector business Law**	**Regulates restricting of public enterprises and transfer of government agencies to holding companies.**	**Ministry of Public Enterprise (MPE)**
Law 95/1992	**Money market Law**	**Legalizes the sale of shares to employees (Employee Share Holder Association- ESA).**	**MPE**
Law 159/1981	**Companies Law**	**Regulates the transfer of public sector companies (under Law 203) to private sector companies.**	**MPE**
Law 100/1996	**Law to establish the Egyptian Electricity Authority**	**Allows private sector developers to invest in electrical power generation projects.**	**MPE**
Law 8/1997	**Investment Law**	**Regulates tax exemptions, currency conversions, profit repatriation, and protection against nationalization for foreign investors.**	**MPE**

Agriculture			
Law 113/1939	**Land tax**	**Sets land tax to 14% of the estimated annual rent of the land (cultivated or not).**	**Ministry of Agriculture and Land Reclamation (MALR)**
1939/1992	**Land tax**	**20 Laws and decrees were issued in this period with refinements, additions, and exemptions.**	**MALR**
Law 96/1992	**Final land tax**	**Sets the rental value to 22 times the prevailing land tax. It maintains the land tax at its previous level (14%) but allows for increase in land rents.**	**MALR**

Analysis and Review of Proposed Modifications in Law 12/1984:

The current applicable laws governing the State's control of water resources and related installations are incapable of meeting the State's needs in a manner consistent with its economic plan. Therefore, it has become necessary to formulate new rules and amend current laws, including Law 12/1984 and Law 213/1994.

For this purpose, a new law must be enacted to reflect the latest developments, concepts, visions, and inputs related to water use management. The new law is intended to achieve the following objectives:

- Highlight the concept of integrated water management for different sources, types, and uses considering the social and economic aspects.
- Develop new water resources.
- Define the responsibilities and authorities of governmental and non-governmental bodies at all central, regional, and local levels.
- Encourage water users to participate in water resource management under the supervision of MWRI officials. Private companies should be encouraged to assume this function, passing associated costs and expenses on to the end users.
- Complete the tile drainage networks so they can reach all the existing farmlands and replace the old ones.

- Expand the use of drainage water for irrigation purposes after conducting field studies to determine suitability for use in their existing condition or after mixing them with freshwater.
- Expand the use of groundwater stock for drinking and irrigation purposes.
- Improve and integrate surface irrigation systems modernizing them on the old lands.
- Continue to implement replacement and renovation projects; improve the performance of hydraulic installations erected on canals and drains and the water distribution systems; adjust water balances; and replace or renovate irrigation and drainage pumps at the end of their life span.
- Continue to conserve the use of irrigation water and apply modern irrigation systems such as sprinkling, dripping and other improved methods adopted pursuant to Law No. 12/1984 as amended.
- Benefit from rain and floodwater.
- Amend the organizational structure, job descriptions, and the ministry previous title, now called the Ministry of Water Resources and Irrigation, to reflect the new water policy philosophy.
- Toughen the penalties for the violations of the law concerning water resources and irrigation regardless of the courts' right to impose other penalties legislated by the penal code or other criminal laws.

In order to achieve the above mentioned targets, the Ministry of Water Resources and Irrigation has formulated the proposed draft law in coordination with the governmental authorities concerned with water resources and irrigation affairs, especially, the Ministry of Agriculture and Land Reclamation, the Ministry of Reconstruction, and the local councils. A workshop was held with about 50 stakeholders from the ministries with water-resources related management responsibilities, NGOs, water users, public personalities, and universities. The purpose of the workshop was to solicit comments on the proposed modifications. The remarks and comments made by the above–mentioned bodies have been taken into consideration while preparing the proposed law.

The proposed law containing 116 articles distributed over 10 parts, can be found in the appendices. It is now retitled to address water resources management.

1. INTRODUCTION

1.1 Overview

Water management is a critical variable in Egypt's economic viability. Effective water management must include a basic legal structure that provides all relevant agencies and stakeholders with guidelines and instruments for planning for new developmental interventions, water allocation and deliveries, operational management and maintenance of the irrigation system, and the management of water quality. Law 12/1984, "Concerning the issue of law on Irrigation and Drainage", was enacted to address these issues. This law was supplemented by Law 213/1994, which formalized the role of farmer participation in water management for most categories of land.

Law 12 and Law 213 define the use and management of public and private sector irrigation and drainage system structures: including main canals, feeders, and drains. They also provide legal direction for the use and maintenance of public and private canals, and specified arrangements for cost-recovery in irrigation and drainage works. In addition, rules are provided for water allocation, rotations, and seasonal activities such as rice cultivation and the construction of water intakes. Law 12 regulates the use of groundwater (construction of wells) and drainage water, and legislates other factors such as protection against flooding, navigation and coastal protection, and general irrigation system protection and expansion in new irrigated lands. Penalties for violation of the laws and by-laws are specified. Law 12 focuses almost entirely on issues pertaining to the mandate of MWRI. It does not provide for the involvement of all stakeholders in the planning and allocation of increasingly scarce water resources.

Supplementary Law 213/1994 provides MWRI with the legal foundation for involving landowners at the mesqa and farm levels in irrigation systems improvement. It also established a fund to finance projects related to the development and maintenance of improved mesqas and promotion of awareness promotion with respect to water use. Law 213 only provides for water user organizations above the mesqa level on new lands. Establishment of organizations on old lands above the mesqa level will require modification of the law.

In light of prevailing and projected water supplies and demographic and ecological conditions in Egypt, the law are in serious need of reconsideration. Law 12 should be revised to take into account current GOE policies on liberalized crop choice and horizontal expansion to new lands. Implementation of this policy benchmark will significantly improve the ability of MWRI to maximize diminishing resources and to guide Egypt's water suppliers and water consumers into the new millennium.

An MWRI Ministerial Decree dated 23 December 1998 authorized the formation of a task committee to revise articles of Law 12 and recommend modifications and development of the law. The committee includes the head of the Irrigation Sector and has representatives from the Drainage Authority, Mechanical Department, Central Directorate of Irrigation Water Distribution and the Central Directorate of Groundwater.

1.2 Purpose of the Report

Benchmark C.5 of APRP Tranche IV (1/7/99-12/31/2001) states that "The GOE (MWRI) will prepare revisions to Law 12/1984 on irrigation and drainage and its supplementary laws, to improve effective water resources management". In support of this benchmark, WPAU/EPIQ is carrying out the following tasks:

- Work closely with the Ministerial Committee in the review of Law 12 and its supplementary laws.
- Identify new areas and concepts related to improved water use and management, taking into account results of the irrigation management transfer, water quality and water reuse benchmarks, and current relevant issues and policies.

The objective of this benchmark report is to summarize past and current irrigation water management policies in Egypt as reflected in Law 12 and Law 213. The institutional and legal frameworks for irrigation and drainage are also addressed. The report outlines and discusses changes and amendments that have been considered in developing the modified law.

1.3. Organization of the Report

Following the introduction, there is an assessment of current irrigation and drainage practices in Egypt (Chapter 2), referring to the features of MWRI policy for irrigation water

management. Legislation governing irrigation and drainage is presented in Chapter 3. A general overview of the institutional aspects of irrigation water management provides the basis for Chapter 4. New areas and concepts related to improved water management and use are identified and discussed in Chapter 5. Analysis and review of proposed amendments to Law 12 and Law 213 are presented in Chapter 6.

1.4 The Need for Reviewing Law 12/1984 and its supplementary Law 213/1994

Laws 12 and 213 were issued to provide a legal basis for irrigation and drainage issues based on the visions of the 1960's and 1970's. Given the major changes in vision and policies, the increasing scarcity of water, the anticipated diversion of Nile water to new lands, and the increased importance of stakeholder participation, the laws need to be carefully reviewed and revised. The objectives of this benchmark focus on strengthening capability to manage water resources in an era of increasing water scarcity, including the involvement of stakeholders at all levels in the planning, management, and allocation of water resources.

Revision of the laws should ensure the establishment of the following:

- More efficient integrated water management at all levels of the Egyptian irrigation and drainage system.
- An updated legal code for irrigation and drainage issues to reflect current and projected practices and situations, including the role of the private sector in water management.
- Establishment of a legal basis for all levels of user organizations in all categories of land in Egypt.
- Better coordination between MWRI, other ministries, and authorities at the local level.
- Increased and more efficient communication and coordination between different sectors of MWRI for planning, implementation, and monitoring.
- Tighter controls over water quality and quantity usage.
- Increased stakeholder involvement in water allocation planning and implementation.
- Improved water delivery and usage efficiency, and more efficient drainage performance.
- Capability to better enforce laws related to water allocation, irrigation and drainage.

2. IRRIGATION WATER MANAGEMENT IN EGYPT

2.1 Egypt's Water Resources

Nile Water

The main and almost exclusive source of surface water is the Nile River. The Nile Water Agreement of 1959 with Sudan defines the allocation of Nile water between Egypt and the Sudan. On average, nearly 85% of the yearly water available to both countries originates in the Ethiopian Highlands. The 1959 agreement was based on the average flow of the Nile during the period 1900-1959 at Aswan, Egypt (84 bm^3/year). The average annual evaporation and other losses in the Aswan High Dam reservoir were estimated at 10 bm^3/yr, leaving a net usable annual flow of 74 bm^3/yr. Under the 1959 treaty, 55.5 bm^3/yr is allocated to Egypt and 18.5 bm^3/yr to the Sudan.

Rainfall

Rainfall in Egypt only occurs in winter in the form of scattered showers. The total annual amount of rainfall may reach 1.5 Bm^3 (Attia, 1996). The amount cannot be considered a reliable source of water due to its spatial and temporal variability. However, along the northwest coast and in Sinai, rainfall and its consequent wadi and sheet runoff are the main sources of water. The rainwater infiltrates the ground, recharging restricted groundwater aquifers. At present, a few scattered communities are cultivating subsistence crops such as barley, wheat, olives, peaches, and figs on limited areas.

Drainage Reuse

The reuse of drainage water is already widespread, whether it is an individual farmer pumping from a drain or major drainage pump stations delivering water back into a main canal. It is this practice that has raised the current overall system efficiency to more than 70%. Ultimately, drainage to the sea should be decreased to the level that is necessary to carry excess salts from the Nile Valley and Delta. If, for example, only water with more than 2500 ppm of dissolved solids was rejected to the sea, then the maximum achievable system efficiency would be on the order of 80%. Drainage water should be used in the area where it is produced, rather than discharged downstream, which makes it more difficult to manage efficiently further down the system. The emphasis should be on smaller reuse schemes throughout Egypt.

Treated Wastewater Reuse

The growing use of water for households and industry will increase the total amount of wastewater available for reuse. Treated wastewater could become an important source for water reuse and should be properly considered in any new water resources development strategy.

Desalination

Desalination in Egypt has been given a low priority when considering non-conventional water resources, mainly because of its relatively high costs. Desalination is being applied only in a few areas along the Red Sea Coast, particularly in tourist resorts where water consumption is relatively low.

Groundwater

Serious and extensive studies of groundwater are comparatively recent in Egypt. In general, information on groundwater is less complete than that on surface water. It is estimated that the total groundwater present in the Nile Valley and the Delta is about 500 bm^3, of which only a small part can be considered as "active storage". The existing annual rate of extraction in this region for domestic, industrial, and agricultural purposes is estimated at 4.5 bm^3. This can probably be increased on a sustainable basis to about 7.5 bm^3 (RIGW, 1992), which is estimated to be equal to the annual recharge rate.

The situation is more complex for groundwater use in the Western Desert, New Valley and Sinai, since this is fossil water and thus not a renewable resource. Use of this or any other fossil water would depend on its quality, cost of pumping, and the economic return over a fixed period. Consideration has also to be given to the potential socio-economic implications for the area when water can no longer be drawn economically. While the use of fossil groundwater has already started in Egypt, there is no clearly stated policy at present.

2.2 History of Irrigation

For thousands of years the Nile River overflowed its banks during flood periods and inundated large areas of land in Egypt adjacent to the River. When the floods abated the river returned to its main channel, leaving behind a layer of silt on the land. The first agricultural activity in Egypt was the sowing of seeds on this land, which had been watered and fertilized

by the natural floods. Archaeological evidence suggests that this agricultural cultivation started in about 5200 BC.

A revolution in agriculture occurred with the beginning of artificial irrigation, including deliberate flooding of areas contained by longitudinal and transverse dikes, and subsequent draining through sluice gates. Basin irrigation was established by the First Dynasty (3050 BC). The first recorded evidence of this type of irrigation is found on the mace head of the so-called Scorpion King, which has been dated about 3100 BC. The mace head shows the Scorpion King cutting an irrigation channel which then bifurcates and appears to feed an irrigated field surrounded by unmistakable palm trees.

Although control of the flood water in this way was an improvement on total dependence on the vagaries of the annual Nile flood, the variations in flood level from year to year were critical, and no irrigation was possible except at times of flood (winter crops only). The second agricultural revolution came with the introduction of lift irrigation. Mechanized irrigation came with the introduction of the shadoof during the 18th Dynasty (1550-1307 BC). The more sophisticated Persian water wheel, or saqia, was introduced in early Ptolemaic times (323-30 BC). This device was able to lift substantial quantities of water. These lifting devices permitted increased reliability in years of low floods and also provided sufficient water for limited summer cropping to be introduced. Summer crops were, however, limited to horticultural varieties because of the absence of the natural fertilizer provided by the Nile flood. This system of irrigation continued largely unchanged until the middle of the nineteenth century.

The cultivated area in ancient Egypt has been estimated between 4 and 5 million feddans. However, the area cultivated each year varied greatly depending on flood levels, food demands, and labor availability. It is thought that about one feddan was cultivated per capita of population.

The impetus of modern development was provided in 1805 by Mohamed Ali, then ruler of Egypt. He recognized agriculture as the primary revenue producer of the century. Accordingly, he instructed that cultivated land be distributed among the people, and he introduced high value crops such as sugar cane, vegetables, fruits, and especially cotton. The production of cotton necessitated a radical change in the irrigation system since it needed to

be planted before the natural rise of the flood, required regular watering, and needed to be protected from inundation during the flood. For the first time controlled irrigation was required, but the natural variation of water levels in the river system caused great problems.

Mohamed Ali called upon his engineers to take measures to solve this problem, and the outcome was the construction of the first man-made structures on the Nile, the Delta barrages. Two barrages were constructed at the head of the Delta across the main Damietta and Rosetta branches, to raise the low summer water levels in the channel sufficiently to enable flows to enter the higher flood level canals. The construction of the Delta Barrages was started in 1843, but various engineering difficulties hindered the progress of the works. It was not until 1861 that the barrages were completed. Fortunately the engineers were able to dissuade Mohamed Ali from his suggestion that stone from the Pyramids be used for the construction. Mohamed Ali died in 1848 before completion of the barrages, but they served well until they were replaced by new structures in 1939. The original Delta barrages are still used as road bridges and stand as an elegant monument to the founder of modern irrigation in Egypt. Following completion of the first barrages, remodeling of canals was undertaken, resulting in the canal system largely as it is today.

In addition to benefiting from the improvement in irrigation supplies, cotton cultivation was given a great impetus by the American Civil War, which resulted in high prices for Egyptian cotton. Production increased from 600,000 to 2,000,000 Kentar (45 kg/kentar) between 1860 and 1864, and by 1900 reached 6,440,000 kentars.

By the end of the nineteenth century, agricultural production was constrained by another factor. The natural flow in the river was sufficient to irrigate only 1.5 million feddans in a low year. This shortage of water for summer crops led to the first storage works on the Nile, the Aswan Dam.

The first half of the 20th century saw tremendous improvements in the Egyptian irrigation systems. The first Aswan Dam was completed in 1902 with a storage capacity of one billion (109) cubic meters. It proved so successful that it was raised in 1912 and further raised in 1934 to increase the storage capacity to 5.1 billion cubic meters. Associated with the development of the Aswan Dam was the extension of the perennially irrigated areas with the construction of further barrages at Assiut (1902, remodeled 1938), Zifta (1902, remodeled in

1954) on the Damietta branch, Esna (1908, remodeled 1947 and now being replaced), Nag Hammadi (1930) and Edfina (1951) on the Rosetta Branch to limit discharge of excess water to the sea.

The completion of the High Aswan Dam (HAD) in 1968 is the most recent revolution in Egyptian agriculture. The enormous storage in the reservoir formed by the High Aswan Dam (total storage 162 billion cubic meters, live storage 90 billion cubic meters) is sufficient to make Egypt virtually independent from the vagaries of variations in the annual Nile flood. After nearly 7000 years during which Egyptian farmers regularly suffered from the effects of annual droughts or floods, they now experience increased irrigated areas, increased cropping intensities, and increased yields.

With the improvement of the irrigation management system, the amount of available irrigation water increased over the years and the government developed plans to utilize the excess water for the irrigation of new agricultural lands, mainly in the desert. During the last decades, land reclamation continued to have a high priority in agricultural development plans in order to cope with growing food demands in the country.

2.3 History of Drainage

Egyptian agriculture has historically been blessed with Nile water that contained a very low concentration of salt and that annually flooded the Nile Valley, thus flushing salt from the soil. Salinity was thus never a problem. Due to several decades of perennial irrigation, however, the water table has gradually risen, with a consequent increase in soil salinity and reduced plant production.

To prevent deterioration of the soil, an open drainage system was constructed, beginning around the turn of the century in the northern part of the Delta and gradually extended to other parts of the country. However, farmers did not fulfill their duty to connect each plot with the open drainage channels, mainly because they could not afford to lose 10-15% of land the area that ditches would have occupied. As a result, the open drainage system was neither completed nor sufficiently effective to have any significant control over the water table, especially in the heavy clay soils of the Delta. Effectiveness was further restricted by inadequate maintenance.

In view of the inadequacy of conventional open drainage methods, research into sub-surface or field drainage systems was initiated in 1983 at 15 experimental stations in different parts of the country. By 1952, pilot projects had been extended to approximately 50,000 feddans. Encouraged by the results, a law was passed in 1956 giving the government responsibility for the execution of sub-surface drainage. An ambitious 30-year program was drawn up to cover all areas under perennial irrigation with tile drains, but organizational and financial constraints forced the Egyptian government to scale down these plans. By 1965 the sub-surface drainage area barely exceeded 300,00 feddans. In the meantime, more modern techniques of plastic pipe drainage were being studied and tested through an FAO pilot research project covering five areas of up to 2,000 feddans each.

In 1968, the commissioning of the High Aswan Dam gave rise to development opportunities as well as challenges. In relation to irrigated agriculture, it opened the possibility for large-scale expansion of the perennial irrigated area. The additions to irrigation water supplies aggravated the drainage problem, however, forcing the government to accelerate the introduction of measures to counteract extensive deleterious effects on groundwater levels. Although the priority attached to the drainage program increased greatly after 1966 and plans were drawn up for draining a million feddans in the Delta during the next five years, progress continued to be slow, hampered mainly by budgetary constraints and the lack of technical and organizational skills. Eventually, the government solicited the help of the international donor community, including the World Bank, to assist in the accelerated implementation of its field drainage program. In 1973, a specialized agency the Egyptian Public Authority for Drainage Projects (EPADP) was set up to carry out the program. Five projects costing a total of $852 million were supported by the World Bank in the period 1970-96, with co-financing from United States, the African Development Bank, Germany and the Netherlands.

The improvement and remodeling of open drains generally presented the least problems. The activity critical to the completion of projects in the past has been the installation of sub-surface drainage. By the end of 1994, the total area with installed sub-surface drains slightly exceeded 4 million feddans, roughly 60% of the total cultivated area. That figure is increasing annually by 170-190,000 feddans. The installed sub-surface drainage system consists of a network of lateral and collector drains. Lateral drains, about 200 m long, originally consisted of pipes of fired clay. In 1938, these were replaced by concrete tiles, and since 1979-80, corrugated perforated polyvinyl chloride pipes have been used. Lateral drains discharge into

collectors, which evacuate drainage water into the open. They are generally constructed of plain or reinforced concrete pipes.

2.4 Features of Egypt's Water Policies

Egypt's water policies have been aimed at different water resource development objectives. It is clear that all policies considered the agriculture sector as the largest user of water, as its share exceeds 80% of the total demand for water. This sector comprises about 40% of the total Egyptian labor force. Also, the share of agricultural production in the gross national product (GNP) is relatively high. Therefore, the success of Egypt's economic development plans and economic growth is closely linked to its ability to develop and implement appropriate water policies that secure and conserve water for new national projects, like the El Salam Canal Project and New Valley project. The sustainability of such projects will depend mainly on the level of success in implementing such water policies.

Water policy development in Egypt faces a number of challenges. There has been a mismatch of water supply and demand, resulting from the increasing demands for water from all sectors. This rate of growth is linked directly to the growth in population and the increase in living standards. In spite of increasing demand, available Egyptian water resources are considered to be limited and the rate of its development much slower than the rate of increase in demand. This means that the gap between available resources and water requirements will increase with time, and Egypt will be facing water scarcity in the near future.

Before 1990, the agricultural land area was considered to be about 6 million feddans, with water requirements equal to 49.7 bcm/year. By the year 1990, the existing agricultural land was considered to be 7.4 million feddans, with the same amount of water that was stated in the previous policies.

All policies emphasized allocating any excess water to the new land reclamation projects. Therefore, projected agricultural expansion varied from policy to policy based on available excess water. Water policies in 1990 expected that maximum agricultural land expansion would be 1.6 million feddans by year 2000, with a total water requirement of 10.2 bcm/year.

The amount of water allocated for power generation, navigation, and regulation has decreased from 4.0 bcm as cited in 1980 water policies to 0.3 bcm in 1990 water policies. This was decided after the drought that lasted for almost 8 years (1979 to 1985). The total inflow to Lake Nasser was below average, and the available storage of the lake reached its minimum level. It was decided to stop any additional water releases for power generation and minimize water releases for navigation.

Accordingly, the Ministry of Electricity started a national program to implement more thermal power generation stations to reduce dependence on hydropower stations for the total performance of the electrical distribution network. Also, the MWRI issued a new system for staggering the winter closure into 5 regions, reducing the amount of fresh water that goes to the sea during that season.

The estimates for municipal water requirements by the year 2000 decreased from 6.8 bcm in 1980 to 3.1 bcm in 1990. The two estimates differ because the 1990 water policy assumed that the efficiency of the domestic water distribution network would be increased from 50% to 80%, resulting in more water savings in that sector.

By contrast, industrial water requirements by the year 2000 increased from 4.0 bcm in the 1980 water policy to 6.1 bcm in the 1990 water policy, mainly because the Government's new policy is to encourage the private sector in industrial investment. Therefore, the country would enter the 21st century with a big expansion in the industrial sector, and increased water demands. Also, the amount of industrial wastewater would increase.

On the supply side, all policies have taken the upper Nile conservation projects into consideration. The 1975 water policy was very optimistic about the completion of these projects. It suggested that Egypt's share from these projects would be 9 bcm/year. The assumption was that all the proposed Upper Nile conservation projects would be completed by the year 2000. In subsequent policies, only the Jungli Canal construction project was taken into consideration. This project was estimated to conserve about 4 bcm/year, to be shared between Egypt and Sudan. Egypt's share from that project was estimated to be 2 bcm/year. This project is currently facing some problems, and most experts estimate that this project will not be completed at least before the year 2017.

Groundwater development has been given more emphasis in recent policies. The 1975 water policy gave agricultural drainage water reuse more emphasis than groundwater. It considered only 0.5 bcm/year as development in extracting from the renewable groundwater aquifer in the Delta region. The 1980 and 1986 water policies mentioned the possibility of extracting about 4.9 bcm of groundwater by 2000. The 1990 water policy introduced the possibility of fossil groundwater exploitation to satisfy part of the agriculture in the new land expansion. This amount of water was estimated to be around 2.5 bcm/year from the Sinai and Western Desert aquifers.

Agricultural drainage water reuse has been considered a major part of the available water that could be used to meet the increasing agricultural demands. The 1975 water policy estimated that the amount of agricultural drainage that could be reused in the Delta region would be 7.6 bcm/year by 2000. This policy was also the only water policy that considered the return flows into the Nile from the upper and middle Egypt drains. This amount of water was estimated to be about 4.4 bcm/year by the year 2000.

The 1980 water policy estimated available agricultural drainage water for reuse in the Delta region by 2000 to be 10.0 bcm/year while in the 1986 and 1990 water policies, this amount was decreased to 7.0 bcm/year. This amount is constrained by the fact that a part of the drainage water must go to the sea to maintain the salt balance of the Delta region. It is also constrained by the quality of agricultural drainage water; the chances of using that water decrease as we go northward because of the effect of seawater intrusion.

Water policy in 1990 considered the effect of the Irrigation Improvement Project implementation on the availability of drainage water. It is assumed that this project will decrease the losses on the farm level and mesqas, which will decrease the available water in the drains and diminish its quality.

Only the 1986 and 1990 water policies took into consideration the water saved from implementation of the Irrigation Improvement Project. The 1986 water policy assumed that by 2000 the project would cover about 2.5 million feddans, and the expected total amount of saved water would be 2 bcm/year. In reality, the project proved to be very slow and costly to implement. Therefore, the 1990 water policy estimated the water that could be saved by this project to be only 1.0 bcm/year by year 2000.

None of the above mentioned water policies took into consideration the use of non-conventional water resources like desalinization of sea or brackish water. But looking to the future and the coming water crises, these kinds of resources may be feasible. With the expected improvement and development of the technologies in that field, production costs of such water may be reduced.

3. LEGISLATION GOVERNING WATER RESOURCES

3.1 Preamble

Laws are regulatory formulae governing the relations among individuals or between the state and the citizenry. They define rights and obligations under the specific circumstances in which they were enacted and enforced. Therefore, man-made laws always require evaluation and rectification over time to keep abreast with change, to fill-in a loophole, or to cope with the changing nature of human beings.

Like other legislation, irrigation and drainage laws have been exposed to amendment, abrogation or rectification. This is more so in modern times, which are rampant with continual change and breath-taking developments. The legislators, therefore, intervene from time to time to restore proper regulation or to introduce new governing rules.

This study sheds light on features of each law governing water resources, without venturing into the details of the provisions of each law. It also reviews the problems that impede implementation and proposes solutions.

3.2 Review of Previous Laws

Rules and regulations for canals and embankments of 1887

This was the first quasi-comprehensive legislation for irrigation and drainage. It had been promulgated in February 1894 and is seen as the primordial substance of the laws on irrigation and drainage in Egypt.

The regulations started by defining the canals, the drains and the mesqas. They obliged the beneficiaries on private mesqas to cleanse them and entitled the Ministry of Water Resources and Irrigation to perform this function at the expense of those beneficiaries who failed to do so. It stated that the maintenance of public drain is the sole responsibility of the state, whereas private drain maintenance is the responsibility of the beneficiaries.

The regulations reiterated the provisions of the decree issued in September 1887 concerning protection against floods and the responsibility of the state and landlords in maintaining the

embankments heads, crossings, levees, and private structures that are integral parts of the basins.

This was indeed natural, as the end of the 19th Century and the beginning of the 20th Century had witnessed the co-existence of both basin and perennial irrigation systems. The Nile Delta was transformed to the latter system while the larger part of Upper Egypt remained under a basin irrigation system.

The regulations underscored the importance of protection of rights on the mesqas and drains. They particularly elaborated on procedures of industrial works such as heads and water pipes, and the regulation of boat passage in the Nile mainstream and main canals.

The regulations delineated actions that could damage the irrigation system, such as the erection of a barrage or the placement of water pipe or siphon, without prior permission. Delineated actions included damages to the river embankments, canals, and the drainage system.

Violators were subjected to a fine that ranged from pt. 25 to the real cost of repair, in addition to imprisonment for a period ranging from one day to 60 days. An administrative committee was empowered to pass such decisions. Its members were the irrigation inspector, the district engineer, and three village mayors appointed by the Ministry of the Interior.

In July 1909, the regulations were amended for such cases where the contravention did not require rehabilitation, in which case the fine was set at a maximum of LE 20.

Law 68 of 1953

With the exception of the decree of June 1899 concerning the maintenance works during the flood season and the decree of May 1903 concerning irrigation of the under-irrigated soils, the above-mentioned regulations for canals and drains remained operative until Law 68/1953 concerning irrigation and drainage was enacted and implemented.

It ensured the irrigation authority full hegemony over water distribution, so as to guarantee equitable access to irrigation water. It also empowered the irrigation authority to prevent

irrigation of the agricultural lands outside the set turns or to irrigate the under-irrigated lands at times other than those set by the Minister of Water Resources and Irrigation.

The law specifically dealt with the problem of slow bureaucratic action. It provided for direct communication between the applicant farmer and the irrigation inspector so as to save time and effort. It also made it incumbent upon the irrigation authority to decide on complaints within a specific period from the date of receiving the complaint. As a result, rules of equity have been established. The law had abrogated the irrigation committees and assigned their jurisdictions to the ordinary courts of law.

Law 68/1953 put special emphasis on "Private Properties Relating to Irrigation and Drainage", by which it meant privately-owned lands situated between the river embankments, the canals banks, the public drains, and lands located 50 meters outside the river embankments and 20 meters outside the end section of public canals and drains. The law considered those lands liable to specific limitations to serve the purpose of irrigation and drainage in their surrounding areas. It provided certain compensations if and when surface soil was taken from such lands or when the outcome of dredging was discarded on them.

The law has regulated the obligatory work for maintaining the riverbanks during the flood. It entitled the Minister of Water Resources, in case the flood was extraordinarily high, to declare a state of emergency. It conferred greater powers on the engineers entrusted with oversight (supervisory) functions so as to counteract over-flooding.

This was the first law that granted irrigation engineers the power of law enforcement agents in providing the facts on irrigation and drainage contraventions.

Some provisions of Law 68/1953 were amended by Law 29/1959, which re-instituted the irrigation and drainage (administrative) committees in lieu of the ordinary courts. Law 164 was promulgated in 1957 to define the procedures to be observed before the administrative committees. It explained, among other things, the format of proving the contravention, the method of notifying the violator and the procedures of summoning him before the administrative committee for passing a judgment on the violation committee.

Pumping fees and machinery

Since the issuance of the decrial order of March 1881, it has been common practice for the MWRI to issue decrees specifying fees of irrigation by the privately-owned pumps used on the river stream, the canals and the mesqas. But since pump owners tended to overvalue their services, Law 20 was issued in 1953 to set the fees according to the categories defined by the Minister of Water Resources. It conferred on irrigation engineers the powers of law enforcement agents regarding violations of the provisions of that particular law; among other things, with the use of water-lifting machines, conditions and regulations for their use and the validity of licenses. It also granted the irrigation department the authority of withholding the water-lifting machines, managed in violation of the provisions of the law, without waiting for the issuance of the judgment on the contravention in question, as judicial procedures might be prolonged.

Fees of irrigation, from public pumps and artesian wells

Law 87, issued in 1942, stipulated that those fees shall be specified in a decree of the Minister of Water Resources. The philosophy behind this trend was that the lands irrigated easily should have free access to irrigation water and that a fee would be due on lands irrigated by pumped water so as to make up for operational costs. To this effect, a Ministerial Decree was issued whereby an annual fee for irrigating a unit area was set. Again, some artesian well owners overvalued the fees, and the government had to intervene by issuing Law 128/1949, which specified certain procedures for the beneficiary farmers using the privately owned artesian wells for irrigating their lands. It obliged well owners not to decline farmers access to water against the fee categories defined in the decree of the Minister of Water Resources. Irrigation engineers retained their power as law enforcement agents until Law 68/1953 was issued, including provisions for water-lifting machines, their use, licenses, and regulations.

Planting of trees on banks of public canals and drains

Law 28/1941 stipulated that owners of lands situated on the banks of public canals or drains are bound to plant trees, as defined by the Ministry of Agriculture (MOA), on the side of the bank bordering their lands. It also obliged them to maintain those trees and prohibited cutting them without prior permission from MOA, in which case the trees would be sold through public auction by MOA staff. The landlord would receive three quarters of the net price. The

purpose of this Law was to promote forestation of the banks of public canals and drains and to expand the country's wood wealth.

Law 71 of 1953

Law 71 was the first Law that regulated rice planting in Egypt. It stipulated that rice planting was not permissible outside regions specified annually by the MWRI. As an exception, rice growing was permitted in Fayoum. The law stipulated that lands with access to artesian irrigation and with infrastructure for drainage might be planted with rice, provided that permission is obtained from the MWRI. Violators were subject to the a fine of LE 25-35 per feddan or fraction of a feddan, which was then equivalent to value of yield per unit area.

The MWRI noticed that court judgments withheld the penalty in many cases, thus encouraging farmers to commit violations of the law. Therefore, Law 250/1956 stipulated that it is impermissible to withhold the enforcement of the penalty.

Law 31/1961 included two major amendments:

- The Minister of Water Resources, in addition to his annual decree specifying areas where rice may be grown, may define a percentage for each region where rice may be additionally grown, provided that the percentage shall be strictly observed so as to ensure availability of water for other plantations.
- The fine for planting rice outside the region specified annually increased proportionately with the increase the rice farm gate price. It was then increased to LE 35-50 per feddan or fraction of feddan.

Law 82 of 1956

On-farm open drains were established at the expense of landlords, based on Law 35/1949. It was later deemed more appropriate by the Ministry of Water Resources to replace the network with tile drainage, so as to maintain the small landholdings. However, implementation was faced with two major impediments:

- Farmers objected to the temporary vacation of their lands for the deployment of drainage pipes.
- The Ministry was unable to access the cost of establishing the tile drainage network.

For these reasons, Law 82/1956 was promulgated. It defined the on-farm drain as "an open or tile drain", so as to overcome the problem of cost recovery. The problem of temporary vacation of the land was overcome by an earlier law promulgated in 1954, which provided for

expropriation of lands for public interest or for the introduction of certain improvements. Likewise, the on-farm drainage Law of 1956 made it obligatory for landlords to repay the cost of establishing open or tile drains.

Law 130/1967

With the expansion of irrigation and drainage networks, navigation was redefined to mean the use of water streams and in-land lakes. Internal navigation was first regulated by Law 13/1917 concerning registration of boats. Later, Law 17/1941 prohibited operation of boats on in-land waters without prior permission (license) from the Ministry of Transport, after the payment of fees and confirmation of technical standards.

The law has conferred upon the employers of the Internal Navigation Division the power of law enforcement agents. Law 75/1946 incorporated one amendment on collection of annual fees by way of administrative sequestration when need arises. Law 10/1956 abrogated Law 17/1941 and regulated internal navigation through such provisions as:

- Adding the Suez Canal to the list of inland water streams;
- using the license for entry into Egyptian sea-ports for loading and unloading;
- making licenses valid only for three years instead of five years;
- issuing a decree specifying safety conditions and determining shipment routes;
- setting a maximum inspection fee before licensing;
- abrogating administrative sequestration as a means of fee collection;
- exempting immobile floats on internal waters from the annual fees;
- multiplying the penalty of fine imprisonment for violations of Law 10/1956;
- imposing a new fine for failure to show the license upon request.

In 1958, a public establishment for internal water transport was created and was converted in 1961 into a public authority. Law 57/1962 was issued to amend some of the provisions of Law 10/1956, including transfer of jurisdiction to the General Authority for Water Transport, reduction in the validity of licenses to two years, and an exemption from loading fees for boats whose loading capacity did not exceed 10 tons. It also made it compulsory for state-owned boats to obtain navigation licenses, having been exempted in the past.

In 1957, Law 130 was issued to regulate anchorage on internal waters. It particularly stated that anchorage shall only be possible on platforms to be specified by the MWRI, in consultation with the concerned ministries. Licenses were issued by the MWRI, thus ensuring safety of water streams and protection of their bank meanders. The law had set an anchorage

fee, paid to the MWRI, from which the state-owned boats were exempt. The law provided for the administrative removal of contraventions and recovery of costs by way of administrative sequestration.

Law 74/1971

This law on irrigation and drainage was issued to add novel provisions to existing laws. For example:

- The cost of establishing on-farm drains was considered as preferential as land tax.
- The MWRI informed the land tax authority about the lands covered with tile drainage network so as to reassess the tax such that the rental value becomes proportional to the increase in yield per unit area.
- The MWRI must license the drilling of artesian wells in the Nile Valley, Delta, Natroun Valley and Tahrir province (Directorate).
- Agencies licensing floats on the Nile banks or major canals must obtain an approval from the MWRI to ensure bank maintenance.
- Drainage engineers were given the powers of law enforcement agents.
- Accentuating the penalties for serious contraventions, which were disproportionately penalized in previous legislations.
- A special fund was created within the Irrigation Authority with an issued capital of LE 700,000 for the damage repairs, if and when violators failed to make repairs.
- Administrative committees were created to decide on the contraventions stipulated in the law. Each committee was composed of a court judge, the district irrigation engineers and a member of the socialist union (then ruling party). The purpose was to expand the administrative committees instead of having only one committee at the governorate level.

Law 68/1953 (law on Irrigation and Drainage) stipulated that the Irrigation Authority may instruct violators to rectify the contravention within the specified dates. Otherwise, repairs must be executed at the violator's own expense. It also provided for the possibility of completing the repairs first and charging the cost to the violator later, if and when the contravention necessitated immediate repair. Law 74/1971 incorporated a condition that the violator must be officially indicated before being requested to repay the cost of repair.

However, the enforcement of this article has proven difficult, due to the fact that violators are rarely detected, let alone the fact that the committees stipulated in Law 74/1971 were not operative. Therefore, the MWRI reconsidered appropriate ways to catch transgressors of public irrigation and drainage utilities. In 1976, an amendment was introduced to Article 80 of Law 74/1971, to read as follows: "When a transgression on irrigation and drainage

utilities is proven, the concerned irrigation engineer has the power to instruct the transgressor to rectify the damage within a set date; or otherwise the repair works will be executed at his own expense. Violators shall be notified in person or by registered recommended mail, or upon receipt of a copy of the technical report prepared by the irrigation engineer. In this case, the violator is bound to pay LE 20 as a deposit to the repair works account. In all cases, the violator shall pay an amount equivalent to the benefits attained as a result of his contravention, according to the categories specified in a decree by the Minister of Irrigation".

Law 134/1983 (Concerning rules and regulations for fisheries and aqua-culture)

The law stipulated that the fish farms must be located in fallow lands, as defined by the Ministry of Agriculture. It also prohibited the use of fresh water for this purpose. According to the law, only agricultural drain and lake waters, as defined by the MWRI, can be used. The MWRI sets the rules of water use and the MALR issues the licenses. The law stipulated a clause for imprisonment for no less than three months and a fine of no more than LE 10,000 as penalties for violation of its provisions.

In view of recent years of shortage in rainfall and droughts in North and East Africa, every drop of water is valuable for development. The MWRI has always been keen to maximize the benefits from the available water resources and safeguard them against possible damage and transgression. It has always sought to secure water to meet the increasing demand by the various sectors including agriculture, the largest user of water resources. Short and long term plans were designed and implemented to improve irrigation, rationalize water use and increase the efficiency of on-farm irrigation. These efforts were crowned with the promulgation of Law 12/1984.

3.3 Review of Present laws

Law 12/1984

In 1984, Law 12 was enacted as a comprehensive legislation on irrigation and drainage affairs. It amended most of the provisions of the previous laws covering, in particular, the following chapters:

Chapter One: Public Properties Relating to Irrigation and Drainage
Chapter Two: Private Mesqas and Drains
Chapter Three: On-farm Drains
Chapter Four: Water Distribution

Chapter Five: Irrigation and Drainage Fees
Chapter Six: Protection of Irrigation, River Navigation and Coasts
Chapter Seven: Penalties
Chapter Eight: General Provisions

In September 1987, the executive regulations (bylaws) were issued by Ministerial Decree No. 14717. Following are the salient features of Law 12/1984:

- Landlords, whose lands are opposite banks of public canals and drains have the right to cut down trees, with the written consent of the Director General of Irrigation, provided that the landlords plant three trees for each tree cut down. The purpose of this article was to preserve the country's wood wealth and to promote forestation on the riverbanks.
- The term "landholders" was used instead of "landlords" in illustrating the demarcation line between holdings, with regard to the dredging and maintenance of the private mesqas and drains. When it relates to the drilling and use of private mesqas or drains across lands owned by others, then the decision becomes the sole responsibility of the landlord.
- The law obliged farmers not to damage the industrial works of the on-farm drains. It also stipulated that the terms of a water-well drilling license have to be strictly observed, including the set water-lifting rates.
- The law includes a special section on "Irrigation of New Lands". It introduced new provisions prohibiting any construction on the northern coast within 200 meters of the Mediterranean Sea water line.
- The law stipulated more severe penalties for those crimes which, in earlier legislation were not given penalties proportional to their consequences on irrigation and drainage utilities. Deterrent penalties were introduced for contraventions to the new provisions of the law.
- The law dissolved the administrative committees constituted within the circuit of each court to decide on irrigation and drainage utilities transgressions. This jurisdiction was assigned to the normal courts of law. The law amended the article pertaining to elimination of damage. It assigned the Director-General of Irrigation the authority to issue an order for the administrative elimination of the consequences of the contravention.
- The law provided for a special fund for repair works in case the violator failed to restore the utility to its original condition. The accrued receipts (fees, fines, charges, damages and cost of removal of the contraventions) must be transferred to that fund.
- The law established a dispute resolution mechanism at the governorate level, with a judge, to be nominated by the chairman of the primary court, as committee-chairman. The committee members are the Deputy Director of the Survey Authority, the Deputy Director of Agriculture and a member of the Governorate's Municipal Council.

Law 213/1994

This law was promulgated to amend some provisions of Law 12/1984. Two new articles have been incorporated. The name of the MPWWR was replaced with the MWRI. Article

64 stipulates that license-holders in the new lands must apply modern irrigation technologies, in accordance with the provisions of the license. The licensing terms, conditions, and of water distribution costs shall be clearly stated.

Article 71 stipulates that the Minister of MWRI shall issue a decree specifying the methodology of managing the improved irrigation systems, including the creation of Water Users Associations (WUAs).

Law 213/1994 has complemented Law 12 with two new articles concerning improved on-farm irrigation in the old lands, where IIP is implemented, and the creation of a special fund to secure financing for developing and maintaining the improved mesqas and increasing public awareness in the field of water use.

In February 1995, the Minister of MWRI issued Decree 149 concerning implementation of some provisions of the law of irrigation and drainage. The decree covered the following major areas:

Section One:	Maintenance of Private Mesqas and Drains
Section Two:	Irrigation of the New Lands
Section Three:	WUAs in the New Lands
Section Four:	Utilization of Improved On-farm Irrigation in the Old Lands
Section Five:	The Special Fund for Developing and Maintaining Mesqas

Law 48/1982

In 1953, Law 196 was issued to regulate the drainage of wastewater from public, commercial and industrial entities into water bodies. It is considered the first legislation that regulates the drainage of liquid waste, including effluents. Law 33/1954 amended some of the provisions of the previous laws in regard to the authority which issues licenses (Ministry of Housing and Utilities) after consulting with the Ministry of Health.

In 1962, Law 93 was issued to regulate drainage of waste into public streams and of liquid water from residential, commercial and industrial operations into water streams. The law continued to permit the drainage of effluents into streams after securing the approvals of MOH, MOI and MWRI. The Ministry of Housing and utilities issues the license, under the conditions:

- The water stream's capacity is enough to receive the liquid waste.
- The liquid waste quality complies with the standards set by the MOH.

The law continued to permit the drainage of effluents into rayahs, canals, drains and lakes, provided that the approval of the MWRI has been obtained by the applicant. The law only made an exception for the Nile's proper stream and main branches. It allowed the extension of the six-month period for the treatment of waste for other equal periods. Even under the circumstances of a real threat, the law did not require prevention of the drainage of waste unless by a reasoned decree.

The executive regulations (by-laws) of this law were issued in Decree 649/1962 by the Minister of Housing, specifying the standards of the waste to be drained and methods of sampling and analysis.

With time, the problem of water pollution became aggravated, and the river system was drastically abused. The problem became more conspicuous in rural Egypt where effluent is drained into the agricultural drains. The MWRI has always viewed these practices as transgressions against irrigation and drainage streams. But it has always lacked the means to remove the contraventions, or the resources to finance this process under Law 169/1953 and Law 93/1962.

In 1982, Law 48 was issued for the protection of the Nile and water streams against pollution. Its by-Law was promulgated in February 1983, including eight chapters:

Chapter One:	Definitions of Water Streams
Chapter Two:	Licensing the Drainage of Treated Liquid Wastewater into Water Streams.
Chapter Three:	Monitoring of Compliance with Licensing Conditions
Chapter Four:	Floats and Mobile Units
Chapter Five:	Sampling and Analysis
Chapter Six:	Standards for Treated Liquid Waste to be Drained into Water Streams
Chapter Seven:	The Special Fund (fees, charges, fines to be transferred to the fund)
Chapter Eight:	General Provisions

3.4 Problems Facing Law Enforcement

Recently, numerous laws have been enacted to regulate the performance of government agencies. Under these circumstances, certain jurisdictions are duplicated, thus leading to

overlaps in certain functions. For example, there is a lack of clear vision as to the roles of MWRI and the municipal units in Law 43/1979 concerning irrigation. Article 12 of Chapter 9 of Law 43 confers the right to assume the following functions on the governorate, within the framework of the MWRI general policies and rules dealing with the following:

- Maintenance of water streams that serve the governorate;
- Maintenance of drains existing in toto within the boundaries of the governorate;
- Operation and maintenance (O&M) of the irrigation and drainage stations serving the governorate;
- Utilization of the groundwater by drilling wells, installing pumps and the related maintenance works;
- Maintenance of private irrigation and drainage facilities;
- Supervision of the irrigation turn system implementation in view of emergency circumstances that require readjustment of the turn interval system;
- Conversion of private mesqas and drains into public properties;
- Elimination of contraventions and transgressions on public irrigation and drainage utilities;
- Approval of new irrigation and drainage projects and management of surveying activities (by offices of the Egyptian Survey Authority at the governorate level);
- Survey services including those relating to notarization;
- Implementation procedures of the Land Title Registry law, as approved by the Board of Directors of the Land Title Registry Fund;
- Implementation of the Agrarian Reform laws;
- Removal of transgressions on state properties;
- Procedures for establishing demarcation lines between state-owned and privately owned land parcels; and
- Surveys of crop plantations to furnish the Ministry of Agriculture with the actual acreage of each crop.

The reality is that Law 12/1984 regulates all the above-mentioned functions through clearly stated provisions.

With regard to Law 48/1982, MWRI's responsibility for the protection of water streams against pollution overlaps with other state agencies, resulting in exacerbation of the water pollution problem. Law 48 includes an article relating to licensing wastewater drainage near residential quarters or the commercial/industrial installations. In the meantime, the local administration Law 43/1979 assigns this responsibility to the municipalities, each within its area of jurisdiction. Municipalities also assume all jurisdictions of ministries, with the exception of national utilities or utilities of a special nature, as specified in a Presidential Decree. Therefore, the governor represents the Executive Authority at the governorate level and oversees the implementation of the state's public policies, service utilities and production, within the governorate boundaries.

Ineffective enforcement of some laws resulted from assigning certain responsibilities to only one state agency. For example, sampling and periodical analysis is the sole responsibility of the MOH. Other government laboratories should be involved. Likewise, a plan should be devised for emergencies resulting from non-compliance with the licensing terms and conditions. The three-month repair period has proven insufficient, and the General Authority for Sanitary Drainage is not in a position to technically keep abreast of state-of-the-art technologies for wastewater treatment plants. Consequently, the applicants for licensing will have to select, on their own, the latest technology in the field of wastewater treatment.

Drainage of treated human or animal waste into fresh waters or groundwater reservoirs needs to be reconsidered. Groundwater reservoirs must be protected so as to ensure non-contamination. In addition, fees and advance payments, as stipulated in the by-laws, are too low since the inflation rate has not been taken into account.

Law 4/1994 (law of the Environment) is more comprehensive. It stipulates more severe penalties for water, air, and soil pollution. For water, pollutants include solar oil, wastewater, and garbage from vessels or from other sources. It clearly defines certain criteria to be met before project construction and during operations. According to the law, compliance with the standards is checked regularly. Action is taken against violators. Fines have been increased and grace periods reduced for redress. If a violator fails to comply with the required measures, EEAA will remove the contravention administratively (using the law-enforcement agency) and withdraw the license immediately. The by-laws specify the prohibited non-degradable pollutants.

3.5 Proposals for Better Law-enforcement

To render Law 12/1984 and Law 213/1994 more effective, they must be reviewed in light of the on-going changes in water management in Egypt. All the laws that relate to irrigation and drainage should include a special clause stating that provisions of the other laws shall not contradict the provisions and rules of the irrigation, drainage and pollution laws. The Irrigation and Drainage law should incorporate a provision that prohibits summoning, arresting, or interrogating MWRI engineers who have law enforcement agent status for performance of duties entrusted to them, without prior written approval from the Minister of MWRI. Likewise, Articles 67, 68, and 74 pertaining to irrigation of the new lands, and

Article 72 regarding fees for irrigation and drainage using state-owned pumps, need to be reconsidered. Chapter 8 of Law 12, pertaining to penalties, has to be reviewed accordingly.

To remove duplication, define responsibilities and accentuate penalties, the following laws need to be reviewed:

Law of the Environment (Law 4/1994);
Law of Irrigation and Drainage (Law 12/1984);
Law of the Protection of the Nile River and its Waterways from Pollution (Law 48/1982);
Law of Desert Lands (Law 143/1981);
Law of Local Municipalities (Law 43/1979);
Law of Agriculture (Law 53/1966); and
Law of Agrarian Reform (Law 178/1952).

4. INSTITUTIONAL ASPECTS OF WATER MANAGEMENT

4.1 The Ministry of Water Resources and Irrigation

Irrigation engineering and water distribution was one of the earliest sciences known to human beings. The Ministry of Water Resources and Irrigation (MWRI) was one of the earliest ministries established in Egypt. In 1844, the Public Engineering Works was established and the Ministry of Public Works was established in 1864.

The MWRI is comprised of nine technical departments with a central administration and a legal department serving all other departments. Of these, the largest and most important is the Irrigation Service, where t he total number of posts exceeds half the number of the whole Ministry.

The Minister of Water Resources and Irrigation presides over all departments and has final authority for the executive. The Under-Secretary is central to ministry functions and the Chief Executive Officer under the Minister. He coordinates the work of various departments, settling questions connected to every aspect of administration and engineering. He is aided by an Assistant Under-Secretary of State.

The offices of the Minister and the Under-Secretary are known as the Central Administration or Secretariat. The Secretariat is directed by the Secretary General, who controls the archives, personnel, translation and other necessary sub-offices, and is generally responsible for the submission of all correspondence in proper form.

Under the direction of the Counselor, a branch of the State Legal Department consults with the Minister and Undersecretary on legal matters and consults the Financial Secretary of the Ministry of Finance to maintain general control over accounts, audits, and stores.

The activities of the irrigation service have two main objectives:

- To distribute water and provide an efficient drainage system and to protect the country against Nile River flooding, through the administration of the laws and regulations embodied in the General Act.

- To design and construct works which ensure better water supply, distribution and/or drainage, greater security, or improved conditions on agricultural lands.

MWRI has a chartered mandate to dominate, develop, and control all water resources and to allocate them for different uses. To undertake this huge responsibility, the ministry has different authorities, departments, and sectors.

The Nile Water Sector is mainly responsible for cooperating with the Upper Nile countries for the benefit of all riparian countries.

The Planning Sector is responsible for water balance studies, to match supply with demand through available planning tools and mathematical models established for this reason.

The Groundwater (GW) Sector together with the GW Research Institute of the National Water Research Center (NWRC) have the responsibility to develop and utilize the groundwater in Egypt in the desert areas, the Nile Valley, and the Delta.

The Irrigation Department with its four sectors; namely the Irrigation Sector, the Barrages Sector, the Agriculture Expansion Projects Sector, and the Irrigation Improvement Sector, is responsible for controlling, distributing and allocating water for agriculture and modernizing the irrigation system to satisfy the demand management programs.

The High Aswan Dam (HAD) Authority has responsibility to operate the dam and the Aswan cascade in storing Nile water and releasing it on a daily basis to satisfy the downstream requirements for all different uses.

The Mechanical Department is responsible for establishing, operating and maintaining irrigation and drainage pump stations.

The Drainage Authority, together with the Drainage Research Institute, has the dual task of providing subsurface drainage to agricultural land to control salinity and water-logging; and undertaking drainage water reuse research for irrigation purposes.

The NWRC and its specialized institutes are undertaking applied research to satisfy the supply and demand management works.

In brief, MWRI has intensive programs in the water research field to satisfy the rapidly increasing demand.

The following are the MWRI departments:

The General Department of the MWRI:
The tasks of the General Department include planning and monitoring the works, projects, and general policies; executing the Nile water agreements; and executing the general plans and policies of the Public Works and Water Resources Sector.

It consists of four main sectors:

- Planning Sector
- Nile water Sector
- Groundwater Sector
- Channel maintenance Sector

Irrigation Department:
The tasks of this department include construction, operation, and maintenance of the canal networks. It also manages irrigation improvement and horizontal expansion projects.

The department consists of four main sectors:

- Irrigation Sector
- Horizontal Expansion and Projects Sector
- Dams and Barrages Sector
- Irrigation Improvement Sector

The Egyptian Public Authority for Drainage Projects (EPADP):
The tasks of this authority include the design, execution, operation, and maintenance of all the surface and subsurface drainage systems in Egypt.

The National Water Research Center (NWRC):
NWRC conducts research and studies in different fields that serve irrigation and the environment.

NWRC consists of twelve institutes:

- Water Management Research Institute
- Canal Maintenance and Weed Control Research Institute
- Drainage Research Institute
- Groundwater Research Institute
- Water Resources Development Research Institute
- Nile Research Institute
- Survey Research Institute
- Hydraulics and Sediment Research Institute
- Construction and Soil Mechanics Research Institute
- Mechanical and Electrical Research Institute
- Coast Protection Research Institute
- Environment Research Institute

The Egyptian General Survey Authority:
The task of this authority includes both land and aerial surveys and the use of satellites to draw different scale survey maps. It also includes the estimation of the country's agricultural area and the determination of city and village borders.

The Mechanical and Electrical Department:
The tasks of this department include the design, construction, operation, and maintenance of all irrigation and drainage pump stations and their mechanical and electrical parts.

The General Authority of the High Aswan Dam (HAD):
The tasks of this authority include the operation and maintenance of HAD and its structures as well as storing and discharging the water from Lake Nasser. It also includes conducting lake measurements and studies.

The Egyptian Authority for Shore Protection:
The tasks of this authority include protecting the northern coast from erosion.

The Irrigation Improvement Sector:
This sector is entrusted with the irrigation improvement program in the old lands. This includes surveying water lost in the mesqa system, increasing the amount of cultivable land, developing a new cadre of engineers and technicians, and providing farmers with technical information.

The Dams and Barrages Sector:
This sector is responsible for design, implementation and maintenance of all barrages in Egypt.

4.2 Roles of other Government Agencies in Water Management

Ministry of Agriculture and Land Reclamation (MALR)

Since 1980, the focus of agricultural policy has been liberalization of the sector by removing controls on farm gate prices, reducing subsidies, and removing restrictions on the import and export of agricultural commodities. The choice of cropping patterns has been left to the farmers, with the exception of the area planted with rice, in view of its high water consumption.

The agricultural strategy builds on these reforms. It aims to ensure efficiency and environmental sustainability in the management and utilization of Egypt's land and water resources, and emphasizes free market considerations and rural development.

MALR and MWRI are jointly responsible for the planning of a horizontal expansion policy. The General Authority for Rehabilitation Projects and Agricultural Development (GARPAD) of MALR is responsible for the design and implementation of the schemes, which are subsequently transferred to public sector agricultural companies or private investors. Water management of newly reclaimed lands was transferred from MALR to MWRI a few years ago.

Ministry of Health and Population (MHP)

MHP is responsible for setting standards for potable water sources, drainage water mixed with freshwater, discharges from municipal and industrial treatment plants, and from river vessels. MHP is the main executing agency for Law 27 (Potable Water Quality law) and maintains an extensive sampling network for drinking water treatment plants and sanitary sewage discharges. For this purpose MHP has two well-equipped central laboratories. MHP is also responsible for the analysis of water samples under Law 48.

Ministry of Housing, Utilities and New Communities (MHUNC)

MHUNC, through the National Organization for Potable Water Supply and Sanitation (NOPWASD), is responsible for the planning, design and construction of drinking water and sanitation plants.

Ministry of Environment Affairs (MEA)

The central organization for environmental protection is the Egyptian Environmental Affairs Agency (EEAA). Through Law 4/1994, EEAA has the enforcing authority with respect to environmental pollution, with the exception of water resources. Through Law 48, MWRI remains the enforcing authority for the water quality.

EEAA is establishing an environmental information system (EIS) to give shape to its role as coordinator of environmental monitoring. Moreover, the staff is being prepared to carry out environmental impact assessments (EIA). Major industries have been visited due to non-compliance with wastewater treatment regulations.

Other Government Agencies

Other ministries that have an interest or role in water resources management are:

- Ministry of Industry, which is responsible for the prevention or treatment of industrial effluents;
- Ministry of Transport, which is responsible for navigation requirements and the disposal of oil and waste from river vessels;
- Ministry of Electricity, which is responsible for cooling water; and
- Ministry of Tourism, which is responsible for floating hotels and tourist vessels.

4.3 Private Sector Role in Water Management

The role of the private sector in water management and public works is already quite substantial and diverse. The private sector actors involved in water management and resources are different in nature:

- Farmers (owners and tenants of agricultural land) and farmers organizations with a strong involvement in water management mainly on the mesqa level;
- Private sector companies (i.e. Egyptian and international consultancy firms, contractors, suppliers), who carry out construction work and services for the MWRI under service contractors;
- Public sector companies that are owned by the government through holding companies, but operating as private sector companies. These companies perform the same services to the MWRI as they did when they were an integral part of MWRI.
- NGOs, active on the governorate level who support farmers in specific fields such as weed control, canal maintenance, water supply, and sanitation.

4.3.1 Mesqa Level: Role of the Farmers

The mesqas at the tertiary level are considered private property. Organization and maintenance of the irrigation and drainage infrastructure at this level is the full responsibility of the farmers. They undertake irrigation and drainage practices by themselves, employ private contractors, or request the MWRI to do the work at their own expense. Where mesqa maintenance is unsatisfactory, the MWRI has the authority to fine farmers or to perform the work at the farmers' expense.

With the start of the IIP program, a new technical and institutional concept has been introduced. The technical concept includes the closing of the mesqa intakes. Each mesqa level will receive a pump installation at the intake from the secondary canal and a raised lined channel or buried pipeline under pressure. Furthermore, the technical concept includes the introduction of continuous flow on the delivery (secondary or branch) canals, combined with the installation of gates maintaining fixed water downstream. The institutional concept is the complete take-over of organization and maintenance at the mesqa level by the Water User Associations (WUAs) covering the mesqa command area.

After an experimental period with pilot projects, the transfer of water management to WUAs at the mesqa level has become a focal point in MWRI policy. The legal basis for WUAs and mesqa improvement cost recovery is laid down in Law 213/1994 and the subsequent Ministerial Decree 14900/1995.

Formation of WUAs (as part of IIP) is now gradually developing under a number of IIP projects, including the World Bank IIP project covering 250,000 feddans in the Nile Delta and a Social Development Fund (SDF) sponsored pilot project in Minya.

4.3.2 Mesqa Level: Role of Private/Public Sector Companies

There has been substantial involvement of contractors in construction at the mesqa level since the start of the sub-surface drainage program in the early 1970s. Both private and public sector companies execute drainage projects under contracts with EPADP. EPADP supply contractors with the necessary drainage machinery, for which they pay from installments due for their work. Today there are 26 pre-qualified contractors who have their own machinery, and sometimes inter-rental is exercised between them. The farmers pay for the drainage system over a 20-year period without interest and with a one year grace period. The system of cost recovery is rather complex and runs through EPADP, the Survey Department and the Land Tax Directorate of the Ministry of Finance. Maintenance of the sub-surface drainage system is the responsibility of the farmers but is presently still carried out by EPADP because local contractors do not have flushing equipment.

Another development with strong private sector involvement on the mesqa level is the physical implementation of IIP, which is carried out by private contractors. Both private

sector contractors and the holding companies are involved in IIP implementation under competitive construction contracts.

4.3.3 Secondary or Branch Canal Level

In recent years the first steps have been taken to expand farmers' participation in water management at the secondary canal level. As a result of recent technical improvements at the secondary and branch levels (continuous water flow), the formation of a Federation of Water Users (FWU) on the secondary or branch canal level has been initiated, on a pilot basis within the IIP areas.

The MWRI is fully responsible for the design, construction, operation, maintenance, and rehabilitation of the irrigation and drainage systems up to the mesqa level. The Ministry's main executing agencies (Irrigation Department, EPADP and MED) have a long-standing tradition of issuing service contracts to private and public sector contractors and to consultants for design, construction and rehabilitation work.

MED, EPADP and the Irrigation Sector provide most of the designs in-house. The design of large structures (dams, barrages, large pumping stations) is generally contracted out to consultancy firms. Most of the construction and rehabilitation work is carried out by private or public sector contractors through service contracts with the MWRI. Construction supervision and contract management is done by the respective MWRI agency.

Operations are the exclusive domain of the MWRI. The Irrigation Department, EPADP, and MED are represented in the irrigation and drainage directorates of each governorate. Through the inspectorates and districts, the ministry's engineers control and manage the irrigation and drainage system up to the mesqa level. MED operates all the pumping stations itself, with the exception of 5 pumping stations in Salheya for which a management contract has been signed with a private sector company.

Maintenance of the irrigation and drainage canals is the responsibility of the MWRI. For the last ten years, the work has been sub-contracted to public sector contractors under a holding company. These companies are now privatized, and the maintenance contracts are tendered

to these companies and other private contractors. The maintenance of the large pumping stations is still fully with MED.

4.3.4 Horizontal Expansion

From its start, private sector participation has been an integral part of the land reclamation program. Construction of the basic infrastructure (canals, roads, pumping stations) is carried out by the private and public sector contractors under service contracts with the MWRI. For small holders and other specific target groups, the on-farm infrastructure (including booster pumping stations) is also provided by the MWRI through contracts with private or public sector companies. Large investors develop the plots on their own account.

It is government policy that organization and maintenance of the system at the farm level is the responsibility of the small-holders. This applies also to the booster pumping stations and groundwater wells that serve groups of farmers (10-50). Here the MWRI faces a serious problem, as most of these groups are not able to perform this responsibility, while the MED has neither the expertise nor human resource capacity to take up this task.

4.4 Non-Governmental Organizations

NGO involvement in water supply management is usually integrated into broader community development programs for the rural population. The water component of these programs is generally focused on hygiene promotion and public health and deals with issues such as safe drinking water, improved sanitation, water quality protection, and manual channel maintenance. The importance of NGO support to the farmers is recognized, but most of the activities take place outside the responsibility of the MWRI.

Projects under the Social Development Fund (SDF) are exceptions. The SDF was established in 1991 by Presidential Decree to facilitate the implementation of the economic reform program, mitigate the adverse affects of structural adjustment on low-income population groups, and seek additional international and national financial resources for poverty alleviation projects. Ministries, governorates, NGOs and local community agencies implement the projects supported by the SFD. An SDF project under preparation deals with the closing of open channels that flow through residential areas.

4.5 International Companies

Over the last few decades, MWRI has contracted many international private sector firms for the design and construction of large infrastructure projects (i.e. sea defense, barrages, large pumping stations), and for support in research, manpower development, and policy development studies. International companies are contracted through international tenders. Most of these projects are partly financed through loans from international funding agencies and/or bilateral donors. The numerous studies and technical assistance projects carried out by international consultancy firms are generally financed through grants from donor agencies. Many of these projects are offered to MWRI as technical assistance, whereas the service contracts are signed between the donor agency and the international firms.

4.6 Decentralization to Farmers' Institutions

The interest of MWRI to decentralize water management, operation, and maintenance responsibilities to farmers' institutions rather than to commercial private companies is based on several elements:

- The commercial private sector may emphasize a short-term profit-making perspective at the expense of maintenance considerations, whereas farmers have a long-term perspective for sustainable agricultural production and therefore are interested in regular maintenance of the system. Farmers' organizations will be more financially efficient in organizing channel cleaning than the commercial private sector.
- The commercial private sector will introduce water pricing. The most influential and rich farmers will most probably be able to obtain most of the water at the expense of the poor farmers. This will increase inequality in the water distribution and reduce overall agricultural production.
- Due to temporary or structural water shortages, conflicts are very common in the farmer communities. Farmers' organizations will be more effective in solving water related problems among themselves.

5. GUIDELINES FOR FUTURE WATER MANAGEMENT

In this section, we address a number of issues to be included in the modified Law 12. This includes the means for achieving sustainable water management such as stakeholder involvement, water management transfer, and demand management.

5.1 Irrigation Improvement Program (IIP)

The IIP is a socio-technical irrigation improvement process involving the development of farmer participation in improvements and the subsequent management of improved systems. The program is removing a number of irrigation-related constraints to agricultural production and water use efficiency in Egypt:

- Irrigation efficiencies (the ratio of water beneficially used to water delivered) are improved primarily through reduction of delivery system operational losses. These efficiency improvements translate to water savings (in a global sense) that can be transferred or reallocated to other uses when the improvements occur in areas where irrigation losses and return flows are to salt or pollution sinks. In any situation, these efficiency improvements translate into local water savings, meaning the freshwater entering a command area is not lost to drains serving the command area.
- Equity of water distribution is improved. Evidence shows substantial head-end/tail-end inequities are relieved, and tail-end farmers previously reliant on pumping of drain water to augment their short water supplies no longer need to perform this activity. Land values at the tail ends of canals and mesqas have increased as a result. Positive environmental and health impacts result since farmers no longer need to pump polluted or saline drain water.
- Fresh water losses by direct flows from canals and mesqas to drains are eliminated, thereby preserving fresh water quality and reducing or eliminating the degradation of this water which occurs when it enters polluted drains.
- Farmers are organized in private, legally-recognized WUAs using a tested and monitored seven-phase process which is supported by the Irrigation Advisory Service. There are many examples of functional WUAs actively operating and maintaining their improved mesqas.
- Farmers report high degrees of satisfaction with their improved mesqas.
- Farmers' irrigation costs (labor, pumping and mesqa maintenance) are substantially reduced.
- Farmers report water supply adequacy (availability, reliability, distribution, etc.) is much improved.
- Farmers report less conflict over water and better communications among themselves and with irrigation officials.
- Increased crop productivity trends are evident, but data are not comprehensive enough to support conclusions for or against the program. This may be due in part to incomplete implementation of the improvement package as well as incomplete

monitoring and evaluation of program impacts. Overall, it is unclear if the combination of inclusive productivity impacts, substantial irrigation cost savings, positive equity impacts, positive environmental and health impacts, and positive social impacts result in economically feasible rates of return on improvement investments. It is difficult to assign an economic value to the positive equity impacts, positive environmental and health impacts, and positive social impacts of IIP.

- Farmer willingness and ability to pay for improvements were studied extensively in support of the mesqa improvement cost recovery legislation (Law 213). However, if actual economic benefits are less than estimated, then willingness and ability to pay may need to be re-evaluated.

5.2 Farmer Involvement in Water Management

The involvement of farmers' organizations in water management can be tested in several ways. In the IIP and in the WB projects, the following activities are considered for decentralization:

- Operation and maintenance of the canals;
- Involvement in decisions on new investments;
- Execution of water distribution;
- Involvement in negotiations on water quantities;
- Collection of fees from inhabitants;
- Control over all water users (landowners, land users, industries using canal water) in the WUA/FWU/WB area;
- Possibility of making contractual arrangements; and
- Control over water quality (sanctions against polluters).

This decentralization of responsibilities will lead to a substantial reduction of the MWRI implementation tasks. It will further promote efficient water use through improved and more even water distribution; thus increasing agricultural productivity. Furthermore it provides the opportunity to establish a balanced system of cost sharing between the central government, local governments, and the water users (farmers). At the moment, transfer of canal system ownership from the government to the new water user institutions is not being considered.

Successful decentralization requires a good understanding of the farmer community and present water management practices at the mesqa level. Lessons learned in IIP include the need for a good understanding of the different views on IIP that exist among the farmers at the mesqa level. Farmers at the upper reach of the mesqa have the fewest problems at present and feel that IIP will not provide them with any direct benefits. The farmers in the middle reach also have access to enough water and in many cases, sell water to the farmers in the lower reach. This group will have the strongest reservations against IIP development, as they

will lose this additional source of income. Water shortages were mainly faced by the farmers in the lower reach (who are generally the poorest farmers in the mesqa). These farmers have the most to gain from IIP but are the least powerful. Any approach to WUA development should take serious account of this diversity between farmers within a mesqa.

5.3 Type of Farmers' Organizations

The irrigation and drainage system has three levels: mesqa, secondary, and main canal. Each level has a different role to play in water distribution or water collection and requires different organization and maintenance activities, and different types of investments. It is logical to use the same three levels in the build-up of water users organizations:

- Water Users Associations (WUA) at the mesqa level.
- Federations of WUAs (FWU) at the secondary or branch canal levels (this may include 10 to 30 WUAs); and
- Water Boards (WB) at the main canal level (this may include 10 to 30 FWUs).

Within the IIP and WBP, most of the above-mentioned decentralization activities are given to any type of farmers' organizations, but the scale of influence varies.

5.4 Irrigation Management Transfer

The transfer of major management responsibilities for irrigation system sections above the mesqa-level from the GOE to stakeholders and/or the private sector is a bold advance toward the goal of participatory management and privatization of the irrigation system. Although irrigation management transfer (IMT) is now a major feature of irrigation delivery in many other countries, IMT has yet to be introduced at any level in Egypt. Successful implementation of this benchmark will be a major turning point for this process to take hold at the grass-roots level of the GOE.

Unlike earlier irrigation improvement efforts in Egypt (e.g. EWUP, ISM, and IIP), which can be classified as " farmer participation in irrigation improvement", the IMT model allows the private sector to take managerial and financial control over operation and maintenance. This will result in direct and immediate reductions in government expenditures, freeing government funds to focus on those tasks which the private sector is unable to effectively

undertake. In the approximately 30 countries where IMT has been introduced so far, the types of reported impacts include:

- An overall reduction in the cost of irrigation;
- Enhanced financial self-reliance of irrigation schemes;
- Expansion of service areas;
- Greater irrigation water efficiency;
- Higher quality technical services to end-users; and
- An increase in cropping intensity and yields.

The incentives for the GOE and farmers to undertake this initiative, therefore, are clear and compelling. As a condition of handing over responsibilities, management transfers are often accompanied by physical rehabilitation of the systems. In most countries, service quality improvement and sustainability of such efforts have remained constant or have improved.

Under IMT models, private sector entities assume managerial control, but not ownership, over the physical infrastructure and its operations. These management entities normally operate over relatively large areas and can be in the form of water user associations, private irrigation companies, cooperatives, or shareholder enterprises. Usually they are financially autonomous, within parameters established by enabling status or decree, and are able to hire or contract for technical operational and management services. Management transfers can be partial, incremental, or total.

Management transfers that occur in a supportive socio-technical context result in improved quality and efficiency of irrigation water delivery, which in turn enhances profitability of irrigated agriculture and decreases the cost of irrigation.

5.5 Water Boards

Farmer participation in water management at the secondary level is a relatively new concept in Egypt, and there is still no legislation to accommodate transfer of water management to farmers at this level. Experiments to establish participatory organizations at the secondary canal level started in Fayoum Governorate in 1995 in order to test different approaches in preparation of the new legislation.

Focus was put on testing different forms and degrees of joint management between farmers and the MWRI rather than on a complete transfer of responsibilities, because:

- Water management is historically rather centralized in Egypt (compared to other countries).
- Existing legislation clearly lays the water management responsibility at the secondary level with the MWRI.
- Lack of tradition with farmers in water management involvement would make a direct transfer rather unrealistic.

Two models were developed and tested:

- A Local Water Board (LWB) consisting of farmers only, on the basis of the law on Private Associations and Unions 32/1964; and
- A LWB including both farmers and officials, established under special Ministerial Decree No. 263/1997.

Main activities of the LWB focused on:

- Joint planning and monitoring of construction, rehabilitation, and maintenance work executed by the Fayoum Irrigation Department and EPADP;
- Execution of channel maintenance by LWB; and
- Participation in the planning and design of sub-surface drainage systems.

The four-year experiments with LWB in 10 secondary canals (1999) indicates the clear benefits to be gained from the active involvement of farmers in water management at the secondary level. The sustainability of these efforts is mostly threatened by the restriction of present legislation. Recommendations for preparation of new legislation include:

- The LWB's formal authority to take water management decisions over all water users in the service area;
- Lifting the restrictions to enter contractual arrangements with private sector companies;
- Giving the LWB the authority to collect money from all water users;
- Procedures for election, representation, and decision making; and
- Clear distinction of tasks and responsibilities between the LWB and the MWRI.

Part of the cost of irrigation infrastructure is paid by farmers through the Agricultural Land Tax. The first agricultural land tax, which dates back to 1939 (Law 113/1939) set the land tax at 14% of the annual rent. Rents were estimated according to Law 35/1935 for a period

of 10 years. Law 113/1939 was amended by 21 laws and decrees in the period between 1939 and1992. The final land tax is Law 96/1992, which sets the rental value to 22 times the prevailing land tax. With this reverse, the land tax remains at its previous level, but permits an increase in land rents based on the level of the land tax. The Cost Recovery Study for IIP in 1991 calculated that the average land tax for Egyptian farmers was LE 30 per feddan per year.

5.6 Demand Management

For decades, water resource managers were told they were responsible only for the supply side. The consumers would determine their demands and water managers were held responsible for providing high quality water, cheaply and reliably.

This may have been a socially acceptable mode of operation, as long as there were no major stresses on water resources. As the stress on resources increased, this attitude was no longer adequate. In countries with water shortages, policies which attempted to affect demand were more common. The term "demand management" has become an acceptable component of water management.

Demand management is the use of technical, educational, legal, and administrative means to affect demand. Such means are employed to affect the total quantity of water used, its distribution over time, the quality of water used by the consumer, and the pressure at which the water is provided. The characteristics of supply determine the schedule of withdrawals from the source, and the sizing and operation of the systems that are required to extract, treat, store, and distribute the water.

Technical means include water efficient facilities such as drip irrigation, recycling of industrial water, and cooling water. For example, drip irrigation has substantially reduced the total amount of water required, and has also allowed its application at a lower rate over a longer period of time, thereby reducing the size of the distribution system and facilitating easy control of the system. Drip irrigation also makes it possible to use low quality water without detrimental effects on yields or negative environmental consequences. The extra cost of drip irrigation is justified by the savings in water, the possibility of using lower quality water, and increased productivity.

Economic means include: pricing mechanisms, incentives for introducing water-efficient devices, and penalties for inefficient water use. The price charged to a consumer should reflect the full true cost of supplying the demand in quantity, distribution over time, quality, and reliability. Pricing for agriculture is frequently a contentious issue in many countries. The tendency is towards more realistic prices, which will cause farmers to use water more efficiently.

Educational means for affecting demand should be viewed as long-term measures to inform society about the true cost of water use, so it can adjust its behavior to be more water sensitive. When there is a water crisis or drought, people tend to respond to pleas for voluntary curtailment of water use. But this response is usually short-lived, and as soon as the crisis is over, people return to wasteful habits. To have a long-term effect, education should begin at a very young age, as children may be the most effective supporters of conservation ethics. This has worked in other cases and should be pursued widely for water conservation.

Legal and administrative means include allocations and restrictions on various types of use, permanently or when the hydrologic situation calls for it. In many countries, there are allocations for water use in irrigation per farming unit or on another basis. Allocation has proven to be a rather poor means for controlling water use, since its application by bureaucracies is frequently influenced by inefficiencies and political manipulations.

5.7 Cost Sharing

The Ministry of Water Resources and Irrigation is responsible for operating and maintaining Egypt's water delivery system, including all the main canals and facilities that carry water from Lake Nasser to secondary canals, mesqas, municipal, and industrial water users throughout Egypt. At present, the ministry does not charge water users for the delivery service. As a result, the Government of Egypt currently pays for all of the operation, maintenance, and replacement of system facilities. There is a desire among government officials to begin collecting some portion of the annual costs of these activities directly from water users.

Several studies have been conducted in recent years with the goal of describing an appropriate distribution of system costs among categories of water users. For example, ISPAN (1993) and IIMI (1996) have produced reports that describe the annual operation and maintenance costs, with recommendations for implementing a cost recovery program. Such a program has not been implemented due to political difficulties and issues involving the ability and willingness of some water users to pay for delivery service.

6. PROPOSED MODIFICATIONS TO LAW 12/1984: ANALYSIS AND REVISION

6.1 Introduction

The present law regulating the irrigation and drainage works is Law No. 12/1984, amended by Law 213/1994. Since the last amendment of the present law, numerous changes have occurred and new visions have called for making the law more flexible. According to the instructions of MWRI, a committee was established to review Laws 12 and 213 and to propose a comprehensive law, including flexible programs, that can accommodate changes and facilitate difficulties in enforcing the present law.

New visions have also appeared in water policy, the most important of which is the necessity for beneficiaries and water users to participate in water management while bearing some of the costs of operation and maintenance.

6.2 Analysis of Proposed Modifications

In this section proposed modifications are analyzed and justifications for each of the proposals are provided.

PART I
DEFINING WATER RESOURCES AND WATER USES; PUBLIC PROPERTIES PERTAINING TO WATER RESOURCES

Part I contains 18 articles distributed over 3 chapters as follows:

Chapter 1: Defining Water Resources and Water Uses (Articles 1 – 2):

According to Article 1, “water resources” means limited natural resources with social, economic, and environmental dimensions having the status of public property. The Ministry of Water Resources and Irrigation is authorized to manage and develop water resources by all possible means and to control and regulate their uses.

This definition is new. The previous laws concerning irrigation and drainage did not contain any definition of the water resource but most of these laws only cited or enumerated some of these resources as part of the list of public properties pertaining to irrigation and drainage.

According to Article 2-a, water resources in use are the Nile River water, rainwater and floodwater, deep groundwater, desalinated water, and any freshwater from non-conventional sources. For the purposes of the present law, water resources include agricultural drainage water, treated industrial and sanitary drainage water, and shallow groundwater.

It is obvious from the previous enumeration of water resources contained under Article 2 that the criterion adopted by the draft law concerning water resources is that water must be fresh and fit for water use.

According to Article 2-b, water uses include irrigation, drinking and human uses, industry, in-stream transportation and river navigation, generation of hydroelectric power, tourism activities, and environment support.

Chapter 2: Public and Private Properties Pertaining to Water Resources (Articles 3-9):

In this chapter, some lands and basins are included as public properties pertaining to the water resources described in the previous law. These include:

- The Lake Nasser Basin;
- Tushka Depression Basin;
- Any other basins formed as a result of building dams or reservoirs;
- The lands, 200 m. wide, located alongside the northern coastline of Egypt, the Red Sea, the Gulf of Suez, and the western side of the Gulf of Aqaba;
- The lands acquired as a result of establishing protection projects or for any other natural reasons;
- The lands surrounding groundwater wells as may be designated by the Ministry of Water Resources and Irrigation; and
- The lands where the ministry conducts artificial water recharge (Article 3).

According to Article 4, no person may, without license from the Ministry of Water Resources and Irrigation, execute in the said lands any work or dig any holes therein that would endanger the safety of the water streams. A competent engineer from the Ministry of Water

Resources and Irrigation is authorized to enter the said lands to inspect the works that are being executed.

The draft law fully authorizes the Minister of Water Resources and Irrigation to take necessary measures to complete the construction of canals and public drains. The Minister is also authorized to deem private feeders (*mesqas*) or private drains as public properties if they are directly connected to the Nile River, public irrigation canals, drains, or lakes (Article5).

The draft law also authorizes the Ministry of Water Resources and Irrigation to supervise in coordination with public or private bodies, public properties pertaining to the water resources, provided that these bodies act under the full control and supervision of the Ministry of Water Resources and Irrigation (Article 6).

Chapter 3: Private Works in the Public Properties Pertaining to Water Resources (Articles 10 – 18)

In this chapter, the proposed law seeks to enable the public properties to carry out their functions in accordance with the general plan of the Ministry of Water Resources and Irrigation. It also tries to limit the effects of private works erected inside these properties and put works under the full control of the Ministry.

That is why the proposed law permits performing or modifying such works only by license from the Ministry of Water Resources and Irrigation in accordance with such conditions as the Ministry may determine. It also requires that such works be performed or modified for a certain fee to be determined by the Minister of Water Resources and Irrigation, and that the fee be paid upon the initial issuance and/or renewal of the license (Article 10).

The draft law authorizes the Ministry of Water Resources and Irrigation to cancel a license for such work or declare the licensed work a public property belonging to the State, at the end of the licensing period. If the license is cancelled after its expiration, no compensation is paid. If the license is cancelled before its expiration, the licensee is compensated for expenditures in proportion to the remaining period of the license (Article 11).

Under the draft law, the Ministry of Water Resources and Irrigation requires the licensee to permit the owners or holders of other lands to benefit from the licensed work, if the license is intended to irrigate land or drain water from that other land. The landlords and landholders of the other lands must pay an appropriate part of the construction costs as determined by the General Manager. The license must designate the area of the land benefiting from the licensed work. The landlords and landholders of the other lands continue to benefit from the licensed work even if new owners or holders of these lands replace the old ones (Article 12).

According to Article (13) of the proposed law, a licensee must maintain and keep the licensed work in good order and repair in accordance with the license conditions. The licensee is also bound to make such renovations or alterations as may be deemed necessary by the ministry for the public interest at such time and in accordance with ministry specifications, otherwise the ministry may implement the same actions at the licensee's expense. Where a license is issued to multiple persons, these persons are deemed jointly liable for execution and liability (Article 13).

The proposed law, however, permits the licensee to renovate or alter the licensed work only with written permission from the Ministry of Water Resources and Irrigation (Article 14).

According to Article (15), where the license conditions are violated and the licensee does not remove the reasons for violation, the department that has issued the license may cancel the license and remove the licensed work.

The license may also be withdrawn if the state performs work that would render the licensed work redundant. In this case, the Ministry of Water Resources and Irrigation is authorized to issue a decision canceling or removing the licensed work without having to pay damages (Article 16).

The proposed law also binds the licensee to remove the licensed work and restore the public property within a period determined by the Ministry of Water Resources and Irrigation. Otherwise, the ministry will do the same at the licensee's expense if the license is not renewed and the ministry has not decided to annex the licensed works to the state's property (Article 17).

Private bridges and other water installations erected across a public irrigation canal, drain, or flood plain under a license by the Ministry of Water Resources and Irrigation are deemed public properties subject to the supervision of the ministry from the moment they are constructed (Article 18).

PART II
ENSURING THE RIGHTS OF USE OF PRIVATE SOURCES AND IRRIGATION AND DRAINAGE STREAMS

The authors of the draft law merged Parts II and III of Law 12/1984, inclusive of all their provisions and amendments, to create Part II of the draft law. Part II of the draft law contains 13 articles (Articles 19 through 31) concerning private mesqas and drains.

The proposed law gives landlords using a joint private mesqa, a joint irrigation stream, or a joint groundwater well, the right to withdraw water from, or drain water into them in proportion to the area of land owned by each landlord.

The draft law authorizes the local irrigation inspector to lay down rotation schedules for this purpose. It also gives landlords the right to complain about the inspector's decisions to the General Manager, who is authorized to make a final decision regarding the complaint. The General Manager is authorized to hear any conflict that may arise from the way the right-of-use is exercised (Article 19).

According to the proposed law, landlords are responsible for dredging and maintaining the private mesqas and drains and preserving the condition of their embankments. If the landlords fail to carry out this functions, the competent manager may instruct them to do so. Failing this, the competent administrative department may undertake the work and collect the actual costs incurred from the landlords in proportion to the land area each of them owns, including any damages resulting from such works (Articles 20 and 21).

In Article 29, the proposed law added groundwater wells to private mesqas and drains as an important water source which the General Manager may decide to block, stop usage of, or remove. There is no doubt that adding groundwater to the water resources conforms with the state's general plan and approach to conserve water use.

The proposed law binds the users of private mesqas, drains, or groundwater wells to prevent damage resulting from them or else the general department may initiate the action at the user's expense (Article 29).

Considering the technological developments in irrigation and drainage systems, the draft law made the provisions of this Part applicable to joint improved systems of irrigation and drainage including groundwater wells (Article 30).

PART III
WATER DISTRIBUTION

Part III contains 22 articles distributed in 3 chapters as follows:

Chapter (1): Water Management and Water Distribution Regulation (Articles 32 – 34)

To catch up with Egypt's rapid economic development, the proposed law authorizes the Ministry of Water Resources and Irrigation to entrust a specialized company, union, association, or board of water users to manage, operate, and maintain, at their expense, parts of:

- Irrigation and drainage branches,
- Private mesqas and drains,
- Tile drains,
- Groundwater wells,
- Joint reservoirs, or
- Improved irrigation systems.

According to the proposed law, the beneficiaries enjoy full independence in this respect (Article 32).

In addition to the rice crop, which consumes great quantities of water, the draft law cites other water-consuming crops. The proposed law prohibits cultivating such crops except with license from the Ministry of Water Resources and Irrigation provided that such crops and the areas where they are cultivated should be designated by the Ministry of Water Resources and Irrigation (Article 34).

Chapter 2: Water Intakes and Drain Outflows (Articles 35 – 41)

To preserve the state's water resources, the draft law prohibits the erection of any water intakes, regardless of their purposes, particularly on the Nile River or on Lake Nasser, except by license from the Ministry of Water Resources and Irrigation. The lake is an important strategic freshwater resource providing desert reclamation projects with water (Article 35).

Chapter 3: Water-Lifting Machines (Articles 42 – 53)

No pumps or equipment driven by a mechanical automated device or by any other method may be erected or operated to lift water from a water resource for any designated use without a license from the competent general department. The license applicant must pay a fee as may be determined by a decision of the Minister of Water Resources and Irrigation (Article 42).

The proposed law has cancelled the 10-year ceiling determined by the previous Law 12/1984 (Article 49).

PART IV
DEVELOPING AND IMPROVING
IRRIGATION AND DRAINAGE SYSTEMS

The provisions of Part IV were introduced into the draft law to reflect development trends to improve existing irrigation and drainage systems. This part contains 14 articles distributed in 2 chapters as follows:

Chapter 1: Developing Surface Irrigation Systems (Articles 54 – 59)

The draft law links the provisions of this chapter with the provisions of Part II; protecting the rights of use of private sources, and private irrigation and drainage streams. The draft law requires that the application of provisions in Chapter I, Part IV, have no negative affects on provisions stated in Part II of the draft law (Article 54).

According to Article (55), the Minister of Water Resources and Irrigation, or his designee, is authorized to order by decision to improve the existing condition of private mesqas in accordance with the field technical and social studies conducted by the Ministry's Irrigation Improvement Sector. The Minister's decision binds all parties involved in the improvement process under the law, including farmers, landlords, and landholders (Article 55).

The Ministry of Water Resources and Irrigation regulates usage and management methods for improved irrigation systems in the old lands. These systems are applied by establishing corporate unions and water users associations for each improved canal or mesqa (Article 56).

Improvement costs for private mesqas and their contents in the old lands are borne by the landlords in proportion to the number of feddans each landlord owns, in accordance with the regulations described under Article 62 of this draft law (Article 57).

Under the proposed law, the Special Fund for financing development and maintenance projects for improved mesqas in the old lands remains unchanged. The Fund was created by virtue of Article (36), bis (1), of Law 12/1984 as amended by Law 213/1994. The Minister of Water Resources and Irrigation determines the rules regulating the Fund's financial policy, and the formation of its board of directors composed of water users' association, union, and water council representatives (Article 58).

The draft law protects these unions, associations, and councils with respect to the use of private pumps. The draft law prohibits the use of any pumps on improved mesqas other than those private pumps used by the water users' associations and unions (Article 59).

Chapter 2: Improving and Developing Drainage Systems (Articles 60 – 67)

According to the draft law, the Minister of Water Resources and Irrigation may decide to temporarily take possession of the lands necessary for the construction of open and tile drainage networks. The Minister may also expropriate ownership of these lands in accordance with the provisions of Law 10/1990 (Article 60).

Costs of erecting and renovating the tile field drains and the open or tile drain collector networks are divided among all properties located in the drainage unit (Article 61), in accordance with the terms and conditions described under Article 62.

According to the draft law, the administration's cost estimates and the landlord's share of these costs are only final after the conclusion of challenge deadlines. Complaints must be filed with the inspector at the local land registry office and passed to a committee convened for this purpose for their decision. The committee is chaired by the survey inspector or acting inspector and comprises representatives from the Ministry of Agriculture and the local cooperative, a specialist from the local survey inspectorate, and an irrigation or drainage engineer from the Ministry of Water Resources and Irrigation. The committee's decision may be challenged before a court but the challenge does not suspend enforcement of the decision (Article 62).

The proposed law assigns periodic general maintenance of the tile drain collectors within specified boundaries to the users unions; otherwise, the general department performs the maintenance. In this case, the general department collects the actual costs associated with the benefits derived from the drain collectors in proportion to the landlord's holdings. Appropriate damages arising from the maintenance are also the landlord's responsibility.

The draft law prohibits tampering or causing damage to the industrial works of both tile field drain network types. Regardless of penal code provisions, the competent engineer must prove violations of Article 66 provisions. If the violator causes third person damage, the engineer may instruct the violator to compensate the third party within a given period; otherwise, the general department compensates the violated party at the violator's expense.

The draft law creates a Special Fund for the implementation and supervision of tile drain projects. Fund resources are obtained from the state's general budget appropriations; grant, loan, and installment proceeds; and fund investment returns. The Minister of Water Resources and Irrigation determines the rules regulating the Fund's financial policy and the formation of its board of directors composed of tile drain collectors users' unions and association representatives (Article 67).

PART V
IRRIGATION OF NEW LANDS

Part V contains 6 articles from Article 68 to Article 73.

The draft law defines "new lands" as every land not previously licensed for irrigation (Article 68).

In order to preserve and conserve the state's water resources, the draft law provides that no land may be sold or allotted for agricultural development purposes by any ministry or body to any individual, group, company or association until the sale or allotment purpose has been indicated and the Ministry of Water Resources and Irrigation (MWRI) determines sufficient permanent water resources are available for irrigation and cultivation needs. The Ministry may determine the water quantities required for non-agricultural uses including industry, commerce or tourism (Articles 69 and 70)

The license to irrigate new lands is issued by the Minister of Water Resources and Irrigation or whomever he may delegate (Article 71).

Unless otherwise specified in the draft law concerning the irrigation of the new lands, all other draft law provisions apply to the irrigation of new lands (Article 72).

For the purposes of enforcing the provisions of Part V, the Minister of Water Resources and Irrigation defines by decision:

- Terms and conditions for licensing the irrigation of new lands;
- Costs and charges for water supply and distribution; and
- Methods of establishing corporate associations and water councils (Article 73).

PART VI
GROUNDWATER

Part VI contains 8 articles from Article 74 to Article 81.

Groundwater is an important water source, especially in deserts and areas with no surface water network. For this reason part VI is devoted entirely to groundwater.

According to Article (74), no deep or shallow groundwater well may be dug in the Arab Republic of Egypt without a license from the Ministry of Water Resources and Irrigation according to conditions set by the Ministry even on lands governed by Law 143/1981 governing desert lands. These regulations apply to citizens, contractors and companies alike (Article 74).

A person licensed to dig a well must comply with the licensing conditions concerning well use, determined rates, and water quantities. The local general department issues and renews the license for well use (Articles 75 and 76).

The license to use the well is withdrawn or cancelled if the well is not used within three years from the date the license is issued or if the well is used for purposes other than those for which the license is issued. The Minister of Water Resources and Irrigation regulates by decision the procedures, methods, and conditions for digging wells (Articles 77 and 78).

The Minister of Water Resources and Irrigation regulates by decision the methods adopted by the Ministry for managing and using the wells by establishing water councils and water users associations. The Minister of Water Resources and Irrigation also defines the wells and mesqas for which erection, management, and maintenance charges are collected (Articles 79 and 80).

The draft law creates a Special Fund to finance the erection of groundwater wells and increase awareness about groundwater preservation (Article 81). This article reflects a new vision and approach.

PART VII
CHARGES OF PUMPS AND WATER-LIFTING MACHINES

Part VII contains 5 articles from Article 82 to Article 86.

According to the draft law, the Minister of Water Resources and Irrigation determines the rates for using the state's pumps and water-lifting machines (Article 82).

The draft law, however, requires that no charges be collected in excess of the fixed charges. If excess charges are collected, the extra excess must be refunded. Excess charges can be disputed regardless of the amount with adequate evidence (Article 83).

According to the draft law, a person licensed to drain water resulting from a non-agricultural activity into the Nile River, groundwater, or public drains, is required to pay charges in accordance with the rules and rates determined by the Minister of MWRI (Article 84).

The draft law also binds a groundwater well or lifting machine user to irrigate and drain water from the land for which the license is issued. Unless there are serious reasons, the user may not cease to use the licensed machines or wells for irrigation or drainage purposes (Article 85).

PART VIII
PROTECTION OF WATER RESOURCES, STRUCTURES, NAVIGATION, AND SHORES

Part VIII, corresponding to Part V of previous Law 12/1984, and contains 12 articles distributed in 3 chapters as follows:

Chapter 1: Protection from High Water Level Threats (Articles 87 – 90)

According to the draft law, the Minister of Water Resources and Irrigation may announce a State of Emergency if there are risks threatening the collapse of dams, reservoirs, or embankments; thus implementing an emergency plan developed by the MWRI for the protection of these important water resources.

Chapter 2: Protection of Water, Removing Obstacles of Irrigation, Drainage, and Navigation (Articles 91 – 95)

Article 91 prohibits works that may affect the water. According to Article 91, no person may waste or squander water. In view of the great importance attached to the High Aswan Dam lake, which provides water to all parts of the country. The draft law prohibits draining into the High Aswan Dam lake from lands, installations, or cruising river units (Article 91).

It also prohibits transporting toxic or hazardous materials by river transportation units through the navigation waterways. Additionally, it prohibits groundwater pollution by injecting liquid wastes or dumping solid scraps (Article 91).

The draft law prohibits establishing fish farms or breeding boxes in the Nile stream and its branches extending to Edfina and Faraskour barrages. The draft law also prohibits the use of agricultural chemicals, installations in the flood plains, or setting up works affecting the water environment of the High Aswan Dam lake and its surrounding constructions (Article 91).

According to the draft law, the Ministry of Water Resources and Irrigation is authorized to license certain works. Some of these works are already provided in Law 12/1984. The draft law, however, introduces additional works, which must be licensed. These include: drainage water irrigation draining into a public drain or groundwater. Digging groundwater wells for irrigation, drinking, or industry; and driving river transportation units, passenger transports, floating hotels, or ferry boats. The permitted tonnage, the navigation route, and the captains' efficiency must be observed (Article 92).

Chapter 3: Sea Coast Management and Protection (Articles 96-98)

The draft law prohibits, without impact on the environmental protection aspects of Law 4/1994, the construction of installations on the coast within 200 m of the shoreline on the Mediterranean and Red Sea coasts, the Gulf of Suez, and the western coast of the Gulf of Aqaba. Exceptions can only be made with a license issued from the general Egyptian Authority for Shore Protection (Article 96).

The draft law does not neglect cases of extreme emergency, which require establishing installations of a special nature inside the prohibited area described in Article 96. In such cases, the General Egyptian Authority for Shore Protection must approve such works in advance, defining the protection works required for that installation. Protection work is carried out against fees determined by draft law executive regulations.

PART IX
PENALTIES

Part IX contains 12 Articles 99 to Article 110 and addresses the penalties for violations of the draft law provisions. Penalties delineated in part IX are subordinate to any tougher penalties stated in either the penal code or other existing laws.

The draft law intends to apply the highest possible deterrents on the individuals and persons governed by or violating, its provisions. For this purpose the draft law:

- Raises the fines imposed under the penal clauses contained in the draft law (Articles 100 – 106);
- Toughens the penalties in case of recidivism (Article 100);
- Links the fine amount to the number of feddans subject to violation (Article 104);
- Authorizes the Ministry of Water Resources and Irrigation to make restitution at the violator's expense, in addition to imposing the determined penalty (Article 108);
- Punishes the violator regardless of landlord, landholder, or squatter status in cases violating the provisions of certain articles (Article 106); and
- Determines a maximum fine of LE 50,000 for violations of Articles 74 and 91.

PART X
GENERAL AND FINAL PROVISIONS

Part X contains 6 articles from Article 111 to Article 116.

According to Article 111, town and village mayors are bound maintain industrial works related to the water resources entrusted to them according to agreed upon conditions between the Ministry of Water Resources and Irrigation and the Ministry of Interior. They are also bound to notify authorities of any loss of these works immediately upon discovery.

The draft law raises the capital of the special fund for restitution from LE 700,000 to LE 10,000,000. This fund, created under article 103, Law 12/1984, concerns irrigation and drainage. The Fund is allocated to cover restitution costs if the beneficiary fails to make restitution. The entire fees, fines, and indemnities pursuant to the draft law accrue to the fund (Article 113).

Article 115 allows the Minister of Water Resources and Irrigation to determine by decision the rules regulating cost sharing by water users for installing water projects and structures.

The draft law creates a committee in each summary court to decide on the crimes identified in the draft law. The Committee, chaired by the court judge is comprised of governorate officials including a works manager selected by the undersecretary for water resources and irrigation; a municipal council member selected by the municipal unit head; a police officer selected by the governorate police department head; and a representative water user from a council, board, league or association selected by the MWRI undersecretary for the governorate. With one month of the initial hearing, the Committee must issue its decision (Article 116).

Establishing a Committee composed as described above would ensure equity because of the members' intimate knowledge of the issues. More importantly, bringing together people's organizations, executive departments, and judicial bodies in dispute settlement would ensure quick dispute resolution based on a clear vision.

7. CONCLUSIONS AND RECOMMENDATIONS

The proposed modifications in Law 12/1984 are classified as follows:

First: Legal Structural Issues

- Change the ministry's name to "Ministry of Water Resources and Irrigation" instead of "Ministry of Public Works and Water Resources".
- Modify the term "Irrigation Director-General " to define individual Director General's responsibilities:
- " Irrigation Director General; Drainage Director General; Nile Protection Director General".
- Replace of the term "pertaining to irrigation and drainage" with the term "pertaining to water resources".

Second: Simplifying Law Applications

Some articles state conditional applications such as: "The condition of threatening the safety of the banks and affecting the water current; thus damaging those banks, other lands, and constructions".

In practice, the violators build or dig on their lands without permits, given that from their viewpoints, such works do not threaten the safety of the banks. It is necessary to re-consider this condition, whereby any building or digging works should be licensed prior to implementation.

Third: Inadequacy of Some Items in Law 12 to Cover all Ministry Responsibilities:

- Public irrigation and drainage does not include the spillways, nor the basins of the High Dam Lake and Tushka Depression. For the populations' safety, it seems imperative to add the natural and artificial spillways and basins of the High Dam Lake and Tushka Depression to the list of water resources public properties.
- Law 12 states that covered drainage cost reimbursements should be recovered either from the landowner, occupant, or both. However, following the law defining the relationship between landowner and tenant, an appropriate modification should require reimbursement costs to be borne only by the landowner.
- Law No. 213/1994, Article 36 (bis1) states that the Minister of Public Works and Water Resources is authorized to decide on the manner in which farmers manage and benefit from improved on-farm irrigation systems in the old lands. In view of the importance of this matter, it is necessary to add a special chapter on improving irrigation and drainage in the old lands (Part IV): giving the Ministry

full authority to implement improvements, by law and Ministerial Decree from the Minister of MWRI.

- The Water User Associations or Water Beneficiary Unions have become principal units in water resources management at the farm level in the new lands, complementing their fundamental roles in the improved irrigation systems in old lands, and the on-farm covered drainage systems.
- The estimated revenue from law violation fines is insufficient to compensate for the actual impact of the violations on agricultural production. Raising fines as a greater deterrent should be considered.
- To simplify lawsuit procedures, the formation of a committee in each court of summary jurisdiction has been proposed. Headed by a judge and composed of specialized personnel, the committee would judge and pass final sentences for crimes committed under this law.

Fourth: New Issues to be Included in the Proposed Law According to the Present Water Policy Vision

- Create administrative boards on the distributaries or branch canal levels responsible for the management, operation, and maintenance of the irrigation and drainage networks, with the participation of the beneficiaries under the supervision of irrigation and drainage officials.
- Encourage the establishment of private companies for the management, operation, and maintenance of irrigation and drainage networks supported financially at the general drain or canal networks level and the water users' associations or beneficiary unions at the on-farm irrigation and drainage levels.

Fifth: Overlap of Laws with the Irrigation and Drainage Law

It is necessary to amend the following laws to avoid the overlap between them:

- Local Administration law
- Agriculture law
- Desert Lands law
- Fallow Lands law
- Environment law

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Task Order 807

ANALYSIS AND REVIEW OF MODIFICATIONS IN LAW 12 OF 1984 ON IRRIGATION AND DRAINAGE

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Appendices

December 2000

Water Policy Program
International Resources Group **Winrock International** **Nile Consultants**

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APPENDIX A

EXPLANATORY NOTE OFA DRAFT LAW ON WATER RESOURCE MANAGEMENT

EXPLANATORY NOTE
OF A DRAFT LAW
ON WATER RESOURCE

Every day cries for conservation of every drop of water are increasing with the world about to suffer from a shortage in freshwater. The situation in the Middle East is even more complicated with limited water resources available, growing population, and increasing urban, agricultural, and industrial expansion. As a result, the demand on water is increasing every year. This compels us to apply advanced appropriate technologies to conserve water and adopt a scientific approach to find methods for increasing our water resources.

Egypt's main fresh water comes from the River Nile. According to the international agreements, Egypt's quota from the Nile water is 55.5 billion cubic meters per annum. This quota enters the water network at the High Aswan Dam and passes down through the Nile Delta until it reaches the Mediterranean Sea. The network also receives groundwater from the western desert and Sinai plus an additional annual amount of 0.5 billion cubic meters of water from rains and floods, besides, reused agricultural drainage water and treated sanitary wastewater.

Egypt's available water, however, is exposed to waste, evaporation, and pollution. Therefore, the Ministry of Water Resources and Irrigation exerts great efforts to minimize the water loss and maximize the efficient use of available water.

The total water used in Egypt is an estimated 72 billion cubic meters with the agricultural activity alone consuming 60 billion cubic meters, or 83% of the total water consumption. The remaining quantity is used for drinking and industrial purposes.

The total efficiency rate of the water network at present (i.e. the percentage of the consumed water quantity to the total water network revenue) is an estimated 70%. This is a high rate if compared to the other countries. The reasons behind this high efficiency rate can be attributed to several factors; the great efforts exerted by the Ministry of Water Resources and Irrigation to operate and maintain the water network; the efficient use of water in most of the Delta and Valley lands; and the present practices of intensive reusing of drainage water estimated at 18 billion cubic meters per year.

With the Ministry's objectives focused on water resource development, control, and regulation by all available means, the Ministry's name was changed into the Ministry of Water Resources and Irrigation to reflect this new policy.

It was also necessary to amend the laws governing irrigation and drainage management with their insufficient rules, especially, law No. 12 of the year 1984 Concerning Irrigation and Drainage. Indeed, there is a need to formulate new rules to regulate the improved irrigation and drainage systems and to try to find solutions for the encountered problems and limit their aggravation. These problems can be outlined as follows:

1. The limited quota of water Egypt receives annually from the River Nile; the main water resource of the country.

2. The decline of water resources as a result of the excessive use; illegal disposal of both human and industrial wastewater; and dumping solid wastes and garbage in groundwater or fresh-water streams.

3. Continuous encroachment against the public properties pertaining to the water resources and the irrigation and drainage related-works. This also includes non-compliance with the obligations related to the rights to use the sources and methods of private irrigation and drainage, and failure to enforce the applicable laws to achieve public or private determent among the people of the community.

The government diligently endeavors to provide the necessary water resources for different uses and to increase the agricultural productivity from the available water in order to achieve food security. To this end, the State exerts great efforts to:

1. Preserve the existing agricultural lands and limit encroachment against these lands.

2. Reclaim desert lands and add new areas to the farmlands in Egypt. It was for this purpose that the State has launched projects for desert reclamation in the southern valley, western Suez Canal, northern Sinai, and western Delta.

3. Minimize cultivating water-consuming crops.

4. Implement projects for agricultural drainage.

There is no doubt that the successful implementation by the State of these projects depends on good planning. It also requires that the State should supervise the implementation of irrigation and drainage projects and all other uses of water. In addition, the State should provide the essential elements for these projects and ensure that they will continue to function properly after they are completed.

The current applicable laws governing the State's control of the water resources and related installations are incapable to meet these needs in an optimum way in line with the State's economic plan. It was against this background that it has become necessary to formulate new rules governing the State's control of the water resources and related installations and to amend the current applicable laws, particularly, law No. 12 of the year 1984 as amended by law No. 213/1994.

For this purpose, a new law must be enacted to reflect the latest developments, concepts, visions, and inputs related to water use management. The new law is intended to achieve the following objectives:

- Highlight the concept of integrated water management for different sources, types, and uses considering the social and economic aspects.
- Develop new water resources.
- Define the responsibilities and authorities of governmental and non-governmental bodies at all central, regional, and local levels,
- Encourage water users to participate in water resource management under the supervision of the Ministry of Water Resources and Irrigation officials. Private companies should be encouraged to assume this function, passing associated costs and expenses on to the end users.
- Complete the tile drainage networks so they can reach all the existing farmlands and replace the old ones.
- Expand the use of drainage water for irrigation purposes after conducting field studies to determine suitability for use in their existing condition or after mixing them with freshwater.
- Expand the use of groundwater stock for drinking and irrigation purposes.
- Improve and integrate surface irrigation system modernizing them on the old lands.
- Continue to implement replacement and renovation projects; improve the performance of hydraulic installations erected on canals and drains and the water distribution systems; adjust water balances; and replace or renovate irrigation and drainage pumps after the end of their life span.
- Continue to conserve the use of irrigation water and apply modern irrigation systems such as sprinkling dripping, and other improved methods adopted pursuant to law No. 12/1984 as amended.
- Benefit from the water of rain and floodwater.
- Amend the organizational structure, job descriptions, and the previous title, now called the Ministry of Water Resources and Irrigation, to reflect the new water policy philosophy.
- Toughen the penalties for the violations of the law concerning water resources and irrigation regardless of the courts' right to impose other penalties legislated by the penal code or other criminal laws.

In order to achieve the above mentioned targets, the Ministry of Water Resources and Irrigation has formulated the proposed draft law in coordination with the governmental authorities concerned with water resources and irrigation affairs, especially, the Ministry of Agriculture and Land Reclamation, the Ministry of Reconstruction, and the local councils. A workshop was held with about 50 stakeholders from the ministries with water-resources related management responsibilities, NGOs, water users, public personalities and universities. The purpose of the workshop was to solicit comments on the proposed modifications. The remarks and comments made by the above–said bodies have been taken into consideration while preparing the proposed law.

The proposed law contains 116 articles distributed over 10 parts can be found in appendix B.

PART I
DEFINING WATER RESOURCES AND WATER USES; PUBLIC PROPERTIES PERTAINING TO WATER RESOURCES

Part I contains 18 articles distributed over 3 chapters as follows:

Chapter 1: Defining Water Resources and Water Uses (Articles 1 – 2):

According to Article 1, "water resources" means limited natural resources with social, economic, and environmental dimensions having the status of public property. The Ministry of Water Resources and Irrigation is authorized to manage and develop water resources by all possible means and to control and regulate their uses.

This definition is new. The previous Laws concerning irrigation and drainage did not contain any definition of the water resource but most of these Laws only cited or enumerated some of these resources as part of the list of public properties pertaining to irrigation and drainage.

According to Article 2-a, water resources in use are the Nile River water, rainwater and floodwater, deep groundwater, desalinated water, and any freshwater from non-conventional sources. For the purposes of the present law, water resources include agricultural drainage water, treated industrial and sanitary drainage water, and shallow groundwater.

It is obvious from the previous enumeration of water resources contained under Article 2 that the criterion adopted by the draft Law concerning water resources is that water must be fresh and fit for water use.

According to Article 2-b, water uses include irrigation, drinking and human uses, industry, in-stream transportation and river navigation, generation of hydroelectric power, tourism activities, and environment support.

Chapter 2: Public and Private Properties Pertaining to Water Resources (Articles 3-9):

In this chapter, some lands and basins are included as public properties pertaining to the water resources described in the previous Law. These include:

- The Lake Nasser Basin;
- Tushka Depression Basin;
- Any other basins formed as a result of building dams or reservoirs;
- The lands, 200 m. wide, located alongside the northern coastline of Egypt, the Red Sea, the Gulf of Suez, and the western side of the Gulf of Aqaba;
- The lands acquired as a result of establishing protection projects or for any other natural reasons;
- The lands surrounding groundwater wells as may be designated by the Ministry of Water Resources and Irrigation; and
- The lands where the ministry conducts artificial water recharge (Article 3).

According to Article 4, no person may, without license from the Ministry of Water Resources and Irrigation, execute in the said lands any work or dig any holes therein that would endanger the safety of the water streams. A competent engineer from the Ministry of Water Resources and Irrigation is authorized to enter the said lands to inspect the works that are being executed.

The draft law fully authorizes the Minister of Water Resources and Irrigation to take necessary measures to complete the construction of canals and public drains. The Minister is also authorized to deem private feeders (*mesqas*) or private drains as public properties if they are directly connected to the Nile River, public irrigation canals, drains, or lakes (Article5).

The draft law also authorizes the Ministry of Water Resources and Irrigation to supervise in coordination with public or private bodies, public properties pertaining to the water resources, provided that these bodies act under the full control and supervision of the Ministry of Water Resources and Irrigation (Article 6).

Chapter 3: Private Works in the Public Properties Pertaining to Water Resources (Articles 10 – 18)

In this chapter, the proposed law seeks to enable the public properties to carry out their functions in accordance with the general plan of the Ministry of Water Resources and Irrigation. It also tries to limit the effects of private works erected inside these properties and put works under the full control of the Ministry.

That is why the proposed Law permits performing or modifying such works only by license from the Ministry of Water Resources and Irrigation in accordance with such conditions as the Ministry may determine. It also requires that such works be performed or modified for a certain fee to be determined by the Minister of Water Resources and Irrigation, and that the fee be paid upon the initial issuance and/or renewal of the license (Article 10).

The draft Law authorizes the Ministry of Water Resources and Irrigation to cancel a license for such work or declare the licensed work a public property belonging to the State, at the end of the licensing period. If the license is cancelled after its expiration, no compensation is paid. If the license is cancelled before its expiration, the licensee is compensated for expenditures in proportion to the remaining period of the license (Article 11).

Under the draft Law, the Ministry of Water Resources and Irrigation requires the licensee to permit the owners or holders of other lands to benefit from the licensed work, if the license is intended to irrigate land or drain water from that other land. The landlords and landholders of the other lands must pay an appropriate part of the construction costs as determined by the General Manager. The license must designate

the area of the land benefiting from the licensed work. The landlords and landholders of the other lands continue to benefit from the licensed work even if new owners or holders of these lands replace the old ones (Article 12).

According to Article (13) of the proposed Law, a licensee must maintain and keep the licensed work in good order and repair in accordance with the license conditions. The licensee is also bound to make such renovations or alterations as may be deemed necessary by the ministry for the public interest at such time and in accordance with ministry specifications, otherwise the ministry may implement the same actions at the licensee's expense. Where a license is issued to multiple persons, these persons are deemed jointly liable for execution and liability (Article 13).

The proposed Law, however, permits the licensee to renovate or alter the licensed work only with written permission from the Ministry of Water Resources and Irrigation (Article 14).

According to Article (15), where the license conditions are violated and the licensee does not remove the reasons for violation, the department that has issued the license may cancel the license and remove the licensed work.

The license may also be withdrawn if the state performs work that would render the licensed work redundant. In this case, the Ministry of Water Resources and Irrigation is authorized to issue a decision canceling or removing the licensed work without having to pay damages (Article 16).

The proposed Law also binds the licensee to remove the licensed work and restore the public property within a period determined by the Ministry of Water Resources and Irrigation. Otherwise, the ministry will do the same at the licensee's expense if the license is not renewed and the ministry has not decided to annex the licensed works to the state's property (Article 17).

Private bridges and other water installations erected across a public irrigation canal, drain, or flood plain under a license by the Ministry of Water Resources and Irrigation

are deemed public properties subject to the supervision of the ministry from the moment they are constructed (Article 18).

PART II
ENSURING THE RIGHTS OF USE OF PRIVATE SOURCES AND IRRIGATION AND DRAINAGE STREAMS

The authors of the draft law merged Parts II and III of Law 12/1984, inclusive of all their provisions and amendments, to create Part II of the draft law. Part II of the draft law contains 13 articles (Articles 19 through 31) concerning private mesqas and drains.

The proposed Law gives landlords using a joint private mesqa, a joint irrigation stream, or a joint groundwater well, the right to withdraw water from, or drain water into them in proportion to the area of land owned by each landlord.

The draft Law authorizes the local irrigation inspector to lay down rotation schedules for this purpose. It also gives landlords the right to complain about the inspector's decisions to the General Manager, who is authorized to make a final decision regarding the complaint. The General Manager is authorized to hear any conflict that may arise from the way the right-of-use is exercised (Article 19).

According to the proposed Law, landlords are responsible for dredging and maintaining the private mesqas and drains and preserving the condition of their embankments. If the landlords fail to carry out this functions, the competent manager may instruct them to do so. Failing this, the competent administrative department may undertake the work and collect the actual costs incurred from the landlords in proportion to the land area each of them owns, including any damages resulting from such works (Articles 20 and 21).

In Article 29, the proposed Law added groundwater wells to private mesqas and drains as an important water source which the General Manager may decide to block, stop usage of, or remove. There is no doubt that adding groundwater to the water resources conforms with the state's general plan and approach to conserve water use.

The proposed Law binds the users of private mesqas, drains, or groundwater wells to prevent damage resulting from them or else the general department may initiate the action at the user's expense (Article 29).

Considering the technological developments in irrigation and drainage systems, the draft Law made the provisions of this Part applicable to joint improved systems of irrigation and drainage including groundwater wells (Article 30).

PART III
WATER DISTRIBUTION

Part III contains 22 articles distributed in 3 chapters as follows:

Chapter (1): Water Management and Water Distribution Regulation (Articles 32 – 34)

To catch up with Egypt's rapid economic development, the proposed Law authorizes the Ministry of Water Resources and Irrigation to entrust a specialized company, union, association, or board of water users to manage, operate, and maintain, at their expense, parts of:

- Irrigation and drainage branches,
- Private mesqas and drains,
- Tile drains,
- Groundwater wells,
- Joint reservoirs, or
- Improved irrigation systems.

According to the proposed Law, the beneficiaries enjoy full independence in this respect (Article 32).

In addition to the rice crop, which consumes great quantities of water, the draft law cites other water-consuming crops. The proposed Law prohibits cultivating such crops except with license from the Ministry of Water Resources and Irrigation provided that such crops and the areas where they are cultivated should be designated by the Ministry of Water Resources and Irrigation (Article 34).

Chapter 2: Water Intakes and Drain Outflows (Articles 35 – 41)

To preserve the state's water resources, the draft Law prohibits the erection of any water intakes, regardless of their purposes, particularly on the Nile River or on Lake Nasser, except by license from the Ministry of Water Resources and Irrigation. The lake is an important strategic freshwater resource providing desert reclamation projects with water (Article 35).

Chapter 3: Water-Lifting Machines (Articles 42 – 53)

No pumps or equipment driven by a mechanical automated device or by any other method may be erected or operated to lift water from a water resource for any designated use without a license from the competent general department. The license applicant must pay a fee as may be determined by a decision of the Minister of Water Resources and Irrigation (Article 42).

The proposed Law has cancelled the 10-year ceiling determined by the previous Law 12/1984 (Article 49).

PART IV
DEVELOPING AND IMPROVING IRRIGATION AND DRAINAGE SYSTEMS

The provisions of Part IV were introduced into the draft Law to reflect development trends to improve existing irrigation and drainage systems. This part contains 14 articles distributed in 2 chapters as follows:

Chapter 1: Developing Surface Irrigation Systems (Articles 54 – 59)

The draft Law links the provisions of this chapter with the provisions of Part II; protecting the rights of use of private sources, and private irrigation and drainage streams. The draft Law requires that the application of provisions in Chapter I, Part IV, have no negative affects on provisions stated in Part II of the draft law (Article 54).

According to Article (55), the Minister of Water Resources and Irrigation, or his designee, is authorized to order by decision to improve the existing condition of private mesqas in accordance with the field technical and social studies conducted by the Ministry's Irrigation Improvement Sector. The Minister's decision binds all parties involved in the improvement process under the law, including farmers, landlords, and landholders (Article 55).

The Ministry of Water Resources and Irrigation regulates usage and management methods for improved irrigation systems in the old lands. These systems are applied by establishing corporate unions and water users associations for each improved canal or mesqa (Article 56).

Improvement costs for private mesqas and their contents in the old lands are borne by the landlords in proportion to the number of feddans each landlord owns, in accordance with the regulations described under Article 62 of this draft Law (Article 57).

Under the proposed Law, the Special Fund for financing development and maintenance projects for improved mesqas in the old lands remains unchanged. The Fund was created by virtue of Article (36), bis (1), of Law 12/1984 as amended by Law 213/1994. The Minister of Water Resources and Irrigation determines the rules regulating the Fund's financial policy, and the formation of its board of directors composed of water users' association, union, and water council representatives (Article 58).

The draft Law protects these unions, associations, and councils with respect to the use of private pumps. The draft Law prohibits the use of any pumps on improved mesqas other than those private pumps used by the water users' associations and unions (Article 59).

Chapter 2: Improving and Developing Drainage Systems (Articles 60 – 67)

According to the draft law, the Minister of Water Resources and Irrigation may decide to temporarily take possession of the lands necessary for the construction of open and tile drainage networks. The Minister may also expropriate ownership of these lands in accordance with the provisions of Law 10/1990 (Article 60).

Costs of erecting and renovating the tile field drains and the open or tile drain collector networks are divided among all properties located in the drainage unit (Article 61), in accordance with the terms and conditions described under Article 62.

According to the draft Law, the administration's cost estimates and the landlord's share of these costs are only final after the conclusion of challenge deadlines. Complaints must be filed with the inspector at the local land registry office and passed to a committee convened for this purpose for their decision. The committee is chaired by the survey inspector or acting inspector and comprises representatives from the Ministry of Agriculture and the local cooperative, a specialist from the local survey inspectorate, and an irrigation or drainage engineer from the Ministry of Water Resources and Irrigation. The committee's decision may be challenged before a court but the challenge does not suspend enforcement of the decision (Article 62).

The proposed law assigns periodic general maintenance of the tile drain collectors within specified boundaries to the users unions; otherwise, the general department performs the maintenance. In this case, the general department collects the actual costs associated with the benefits derived from the drain collectors in proportion to the landlord's holdings. Appropriate damages arising from the maintenance are also the landlord's responsibility.

The draft Law prohibits tampering or causing damage to the industrial works of both tile field drain network types. Regardless of penal code provisions, the competent engineer must prove violations of Article 66 provisions. If the violator causes third person damage, the engineer may instruct the violator to compensate the third party within a given period; otherwise, the general department compensates the violated party at the violator's expense.

The draft law creates a Special Fund for the implementation and supervision of tile drain projects. Fund resources are obtained from the state's general budget appropriations; grant, loan, and installment proceeds; and fund investment returns. The Minister of Water Resources and Irrigation determines the rules regulating the Fund's financial policy and the formation of its board of directors composed of tile drain collectors users' unions and association representatives (Article 67).

PART V
IRRIGATION OF NEW LANDS

Part V contains 6 articles from Article 68 to Article 73.

The draft Law defines "new lands" as every land not previously licensed for irrigation (Article 68).

In order to preserve and conserve the state's water resources, the draft Law provides that no land may be sold or allotted for agricultural development purposes by any ministry or body to any individual, group, company or association until the sale or allotment purpose has been indicated and the Ministry of Water Resources and Irrigation (MWRI) determines sufficient permanent water resources are available for irrigation and cultivation needs. The Ministry may determine the water quantities required for non-agricultural uses including industry, commerce or tourism (Articles 69 and 70)

The license to irrigate new lands is issued by the Minister of Water Resources and Irrigation or whomever he may delegate (Article 71).

Unless otherwise specified in the draft Law concerning the irrigation of the new lands, all other draft Law provisions apply to the irrigation of new lands (Article 72).

For the purposes of enforcing the provisions of Part V, the Minister of Water Resources and Irrigation defines by decision:

- Terms and conditions for licensing the irrigation of new lands;
- Costs and charges for water supply and distribution; and

- Methods of establishing corporate associations and water councils (Article 73).

PART VI
GROUNDWATER

Part VI contains 8 articles from Article 74 to Article 81.

Groundwater is an important water source, especially in deserts and areas with no surface water network. For this reason part VI is devoted entirely to groundwater.

According to Article (74), no deep or shallow groundwater well may be dug in the Arab Republic of Egypt without a license from the Ministry of Water Resources and Irrigation according to conditions set by the Ministry even on lands governed by Law 143/1981 governing desert lands. These regulations apply to citizens, contractors and companies alike (Article 74).

A person licensed to dig a well must comply with the licensing conditions concerning well use, determined rates, and water quantities. The local general department issues and renews the license for well use (Articles 75 and 76).

The license to use the well is withdrawn or cancelled if the well is not used within three years from the date the license is issued or if the well is used for purposes other than those for which the license is issued. The Minister of Water Resources and Irrigation regulates by decision the procedures, methods, and conditions for digging wells (Articles 77 and 78).

The Minister of Water Resources and Irrigation regulates by decision the methods adopted by the Ministry for managing and using the wells by establishing water councils and water users associations. The Minister of Water Resources and Irrigation also defines the wells and mesqas for which erection, management, and maintenance charges are collected (Articles 79 and 80).

The draft Law creates a Special Fund to finance the erection of groundwater wells and increase awareness about groundwater preservation (Article 81). This article reflects a new vision and approach.

PART VII
CHARGES OF PUMPS AND WATER-LIFTING MACHINES

Part VII contains 5 articles from Article 82 to Article 86.

According to the draft law, the Minister of Water Resources and Irrigation determines the rates for using the state's pumps and water-lifting machines (Article 82).

The draft Law, however, requires that no charges be collected in excess of the fixed charges. If excess charges are collected, the extra excess must be refunded. Excess charges can be disputed regardless of the amount with adequate evidence (Article 83).

According to the draft law, a person licensed to drain water resulting from a non-agricultural activity into the Nile River, groundwater, or public drains, is required to pay charges in accordance with the rules and rates determined by the Minister of MWRI (Article 84).

The draft law also binds a groundwater well or lifting machine user to irrigate and drain water from the land for which the license is issued. Unless there are serious reasons, the user may not cease to use the licensed machines or wells for irrigation or drainage purposes (Article 85).

PART VIII
PROTECTION OF WATER RESOURCES, STRUCTURES, NAVIGATION, AND SHORES

Part VIII, corresponding to Part V of previous Law 12/1984, and contains 12 articles distributed in 3 chapters as follows:

Chapter 1: Protection from High Water Level Threats (Articles 87 – 90)

According to the draft Law, the Minister of Water Resources and Irrigation may announce a State of Emergency if there are risks threatening the collapse of dams, reservoirs, or embankments; thus implementing an emergency plan developed by the MWRI for the protection of these important water resources.

Chapter 2: Protection of Water, Removing Obstacles of Irrigation, Drainage, and Navigation (Articles 91 – 95)

Article 91 prohibits works that may affect the water. According to Article 91, no person may waste or squander water. In view of the great importance attached to the High Aswan Dam lake, which provides water to all parts of the country. The draft law prohibits draining into the High Aswan Dam lake from lands, installations, or cruising river units (Article 91).

It also prohibits transporting toxic or hazardous materials by river transportation units through the navigation waterways. Additionally, it prohibits groundwater pollution by injecting liquid wastes or dumping solid scraps (Article 91).

The draft Law prohibits establishing fish farms or breeding boxes in the Nile stream and its branches extending to Edfina and Faraskour barrages. The draft law also prohibits the use of agricultural chemicals, installations in the flood plains, or setting up works affecting the water environment of the High Aswan Dam lake and its surrounding constructions (Article 91).

According to the draft Law, the Ministry of Water Resources and Irrigation is authorized to license certain works. Some of these works are already provided in Law 12/1984. The draft Law, however, introduces additional works, which must be licensed. These include: drainage water irrigation draining into a public drain or groundwater. Digging groundwater wells for irrigation, drinking, or industry; and driving river transportation units, passenger transports, floating hotels, or ferry boats. The permitted tonnage, the navigation route, and the captains' efficiency must be observed (Article 92).

Chapter 3: Sea Coast Management and Protection (Articles 96-98)

The draft law prohibits, without impact on the environmental protection aspects of Law 4/1994, the construction of installations on the coast within 200 m of the shoreline on the Mediterranean and Red Sea coasts, the Gulf of Suez, and the western coast of the Gulf of Aqaba. Exceptions can only be made with a license issued from the general Egyptian Authority for Shore Protection (Article 96).

The draft Law does not neglect cases of extreme emergency, which require establishing installations of a special nature inside the prohibited area described in Article 96. In such cases, the General Egyptian Authority for Shore Protection must approve such works in advance, defining the protection works required for that installation. Protection work is carried out against fees determined by draft law executive regulations.

PART IX
PENALTIES

Part IX contains 12 Articles 99 to Article 110 and addresses the penalties for violations of the draft law provisions. Penalties delineated in part IX are subordinate to any tougher penalties stated in either the penal code or other existing laws.

The draft Law intends to apply the highest possible deterrents on the individuals and persons governed by or violating, its provisions. For this purpose the draft Law:

- Raises the fines imposed under the penal clauses contained in the draft Law (Articles 100 – 106);
- Toughens the penalties in case of recidivism (Article 100);
- Links the fine amount to the number of feddans subject to violation (Article 104);
- Authorizes the Ministry of Water Resources and Irrigation to make restitution at the violator's expense, in addition to imposing the determined penalty (Article 108);
- Punishes the violator regardless of landlord, landholder, or squatter status in cases violating the provisions of certain articles (Article 106); and
- Determines a maximum fine of LE 50,000 for violations of Articles 74 and 91.

PART X
GENERAL AND FINAL PROVISIONS

Part X contains 6 articles from Article 111 to Article 116.

According to Article 111, town and village mayors are bound maintain industrial works related to the water resources entrusted to them according to agreed upon conditions between the Ministry of Water Resources and Irrigation and the Ministry of Interior. They are also bound to notify authorities of any loss of these works immediately upon discovery.

The draft law raises the capital of the special fund for restitution from LE 700,000 to LE 10,000,000. This fund, created under article 103, Law 12/1984, concerns irrigation and drainage. The Fund is allocated to cover restitution costs if the beneficiary fails to make restitution. The entire fees, fines, and indemnities pursuant to the draft Law accrue to the fund (Article 113).
Article 115 allows the Minister of Water Resources and Irrigation to determine by decision the rules regulating cost sharing by water users for installing water projects and structures.

The draft Law creates a committee in each summary court to decide on the crimes identified in the draft Law. The Committee, chaired by the court judge is comprised of governorate officials including a works manager selected by the undersecretary for water resources and irrigation; a municipal council member selected by the municipal unit head; a police officer selected by the governorate police department head; and a representative water user from a council, board, league or association selected by the MWRI undersecretary for the governorate. With one month of the initial hearing, the Committee must issue its decision (Article 116).

Establishing a Committee composed as described above would ensure equity because of the members' intimate knowledge of the issues. More importantly, bringing together people's organizations, executive departments, and judicial bodies in dispute settlement would ensure quick dispute resolution based on a clear vision.

The Minister of Water Resources and Irrigation is pleased to submit the attached draft law for approval and necessary action for its enactment.

Minister of Water Resources and Irrigation

APPENDIX B

PROPOSED MODIFICATIONS IN LAW 12/1984

DRAFT LAW CONCERNING WATER RESOURCES

PART I
DEFINING WATER RESOURCES AND WATER USES; PUBLIC PROPERTIES PERTAINING TO WATER RESOURCES

Chapter 1
Defining Water Resources and Water Uses

Article (1):

"Water Resources" means limited natural resources with social, economic, and environmental dimensions having the status of public property. The Ministry of Water Resources and Irrigation is authorized to manage and develop the water resources in all possible means; and to control and regulate their uses.

Article (2):

One. Water Resources in Use:

a-1 River Nile water;
a-2 Rainwater and floodwater;
a-3 Deep groundwater;
a-4 Desalinated water;
a-5 Any freshwater from unconventional sources

For the purposes of this law, there are deemed water resources the following re-cycled:

a-6 Shallow groundwater;
a-7 Agricultural drainage water; and
a-8 Treated industrial and sanitary drainage water.

Two. Water Uses:

b-1 Irrigation;
b-2 Drinking and human uses;
b-3 Industry;
b-4 In-stream transportation and river navigation;
b-5 Generation of hydroelectric power; and
b-6 Tourism activities and environment support.

Chapter 2

Public and Private Properties

Pertaining to Water Resources

Article (3):

The Public properties pertaining to the water resources include:

a. The River Nile stream (with its branches) and the embankments thereof inclusive of all the lands located between the Nile embankments but exclusive of the lands and installations privately owned by the State or any other person.

b. The main canals, public canals, public drains and the banks thereof inclusive of the lands and installations located between those banks unless such lands or installations are privately owned by the State or any other person.

c. Flood plains.

d. The installations controlling, distributing, and managing the water.

e. The High Dam Lake basin; Tushka depression basin; Tushka spillway canal; and any other basins formed as a result of building dams or reservoirs.

f. The lands, 200 m. wide, located, in the Arab Republic of Egypt alongside the coastal line of the Mediterranean Sea, the Red Sea, the Suez Gulf, and the western side of Aqaba Gulf; and the lands acquired as a result of establishing protection projects or for any other natural reasons.

g. The lands designated by the Ministry of Water Resources and Irrigation around the groundwater wells owned by the State to protect and ensure the best use of these wells. Also, the lands in which the Ministry undertakes artificial recharge of groundwater.

h. The lands expropriated for the public interest to develop, manage, and use the water resources.

Article (4):

- The lands privately owned by the State, or by any other public or private persons; or by individuals located inside the River Nile banks, the public irrigation canals, the public drains, or the flood plains;
- the lands stretching for 30 meters wide outside the River Nile banks, or for 20 meters wide outside the constructions of the irrigation canals and drains, and flood plains;

- the banks of the High Dam Lake in accordance with the executive regulations; and
- the surroundings of the groundwater water wells.

are, even if entrusted to a body referred to under article (6), subject to the following limitations for the service of the general purposes of the water resources:

a. The Ministry of Water Resources and Irrigation may undertake such works as it may deem necessary to protect, maintain, or rehabilitate the embankments or public installations and may take from the said lands the earth needed for such works provided that the owners of these lands are fairly compensated in accordance with the law.

b. The Ministry of Water Resources and Irrigation may dump into the said lands the earth produced from dredging the public irrigation canals, the public drains, and the flood plains provided that the owners of these lands are fairly compensated in accordance with the law.

c. No person may without license from the Ministry of Water Resources and Irrigation erect in the said lands any work or dig any holes therein.

d. Without prejudice to provisions of Articles (3) and (5), the competent engineer of the Ministry of Water Resources and Irrigation may enter the said lands to inspect the executed works. If the competent engineer finds out that a work has been or is being performed in violation of the above-said provisions, he may instruct the violator to remove such works within a reasonable period of time, otherwise, the engineer may instruct that such works be stopped and removed by administrative way at the violator's expense without need to waiting for a court judgment.

Article (5):

The Minister of Water Resources and Irrigation may by decision deem a private feeder (*mesqa*) or a private drain a public irrigation canal or a public drain if such *mesqa* or drain is directly connected to the River Nile, a public irrigation canal, a

public drain, or a lake. The Minister of Water Resources and Irrigation may expropriate such other surface areas as may be needed to complete the constructions of the public irrigation canal or public drain.

Article (6):

The Ministry of Water Resources and Irrigation supervises the public properties stated in Article (3) of this law. The Ministry, however, may entrust to another ministry, a public department, a local government unit, a public or private authority, a water board, or a water union, the supervision of any part of these properties. The said bodies should not violate this law or its executive regulations.

Article (7):

Where there is a change in the water level due to any emergency or unforeseen or unexpected reasons, the State is not liable for any damage caused to the lands or the installations located inside the constructions of the public properties pertaining to the water resources referred to under Article (3).

Article (8):

No lands owned by the State and located inside the public properties pertaining to the water resources may be planted or used except with a permission from the Ministry of Water Resources and Irrigation and in accordance with the conditions stipulated by the Ministry.

Article (9):

No trees or palms may, without license from the Ministry of Water Resources and Irrigation, be planted on or inside the public embankments or in the public streams

and other public properties pertaining to water resources. The trees that have been planted or are being planted in such lands are deemed a public property of the state.

CHAPTER 3

PRIVATE WORKS IN THE PUBLIC PROPERTIES PERTAINING TO WATER RESOURCES

Article (10):

No private work may be performed within the boundaries of the public properties pertaining to the water resources and no alterations may be made in such properties except with license from the Ministry of Water Resources and Irrigation in accordance with such conditions as the Ministry may determine and upon the payment of a fee to be determined by decision of the Minister of Water Resources and Irrigation. The same charge is due when extending the said license.

Article (11):

The Ministry of Water Resources and Irrigation may require to license a work, referred to under the previous article, that such work becomes, at the end of the license or at any time during the license period, a public property of the State. If the work, however, is removed or the allotment is changed before the end of the license period, the licensee is compensated for the work cost in proportion to the remaining period of the license except if the Ministry makes an arrangement that would render such work redundant.

Article (12):

Where the licensed work is intended to irrigate a land or drain water therefrom, the Ministry of Water Resources and Irrigation may require that the owners or holders of the other lands be permitted to benefit from such work provided that they pay an

appropriate part of the construction costs to be determined by the competent general manager. The license must designate the area of the land benefiting from the licensed work. The benefiting lands continue to benefit from the licensed work even if new owners or holders of these lands replace the old ones.

Article (13):

A licensee shall maintain and keep in good order and repair the licensed work in accordance with the license conditions and shall make such renovation or alteration as may be deemed necessary by the Ministry at such time and in accordance with such specifications as the Ministry determines, otherwise, the Ministry implements the same at the licensee's expense. Where a license is issued to multiple persons, these persons are deemed jointly liable for execution and liability.

Article (14):

A licensee may not, without written permission from the Ministry of Water Resources and Irrigation, rehabilitate or alter a licensed work.

Article (15):

Where a license condition is violated or negative effects have arisen due to the licence and the licensee does not avoid or remove it at such time as the Ministry may determine, the department which has issued the license may cancel the license, or prevent the work from being used, or remove it.

Article (16):

Where the State performs a work that would render the licensed work redundant, the license provided under Article (10) is cancelled and in this case the Ministry of Water Resources and Irrigation may issue a decision to keep or remove the work without having to pay damages in both cases.

Article (17):

Where a license is not renewed in accordance with Article (10) and the Ministry has not decided to annex the licensed works to the State's property in accordance with Article (11), the owners of such works shall remove them and restitute the public property within such period as may be determined by the Ministry of Water Resources and Irrigation, otherwise, the Ministry will do the same at the expense of the owners of these lands.

Article (18):

The private bridges and other hydraulic structures, which are constructed across the public irrigation canals or the public drains or the flood plains under prior license, are, once they are constructed, deemed public property controlled and supervised by the Ministry of Water Resources and Irrigation.

PART II

PROTECTING THE RIGHTS OF USE OF THE PRIVATE SOURCES AND PRIVATE STREAMS USED FOR IRRIGATION AND DRAINAGE

Article (19):

Landlords using a joint private *Mesqa* or any other joint irrigation stream or a joint groundwater well, or a joint booster station, or a joint private drain may withdraw water from, or drain water into, the same in proportion to the area of land owned by each landlord.

The local irrigation inspector lays down the rotation schedules for the lands to which this system applies and the concerned administrative department or the boards or unions of water users apply such schedules under the supervision of the local irrigation inspector. Complaints about the decisions of the competent local irrigation inspector are submitted to the competent general manager and the decision thereof on such complaints is final. The competent general manager is authorized to hear any conflict that may arise from the way the said right of use is exercised.

Article (20):

Landlords using private *Mesqas* or private drains shall dredge such Mesqas or drains; clear them of any plants and weeds impeding the water movement; maintain them; and preserve their embankments in good condition. The landlords using the groundwater wells shall clear and maintain such wells.

Article (21):

The competent general manager may, upon a report from the competent engineer on a complaint filed by an interested person concerning a violation of the previous article, notify the concerned administrative department or the unions or associations of water users to instruct the landlords or landholders to clear the *Mesqa*, or drain, or well or remove the impediments hindering the movement of water, or maintain such *Mesqas*

and drains, or rehabilitate the embankments thereof, or re-erect the embankments at a fixed date. Failing this, the competent general department implements the same and the actual costs thereof are charged by administrative ways from the landlords using such *Mesqa* or drain or well in proportion to the land area each of them owns including the damages to be paid for each land occupied or damaged because of such works.

Article (22):

Where the lands located at the sides of the private *Mesqa* or private drain are the property of multiple persons, the center of the *Mesqa* or the drain is deemed a separating line between their properties in respect of the dredging and maintenance works unless a contrary evidence is established.

Article (23):

The lands in which a private *Mesqa* or a private drain passes is deemed encumbered with servitudes in favor of the other lands using such *Mesqa* or drain unless a contrary evidence is established.

Article (24):

Where a landlord or a landholder or a leaseholder files a complaint with the competent general department because he is unduly prevented or obstructed from:

- using a private *Mesqa* or a private drain or any method or system of improved irrigation; or
- entering any land for clearing and maintaining such *Mesqa* or drain or advanced method of irrigation, which is his only available way of irrigation or drainage, or
- renovating such *Mesqa* or drain or advanced method of irrigation,

Then, the competent general manager shall, if it is proved that the land of the claimant was benefiting from the claimed right in the year prior to filing such complaint, issue a provisional decision to enable the claimant and any other users to exercise the claimed right provided that the issued decision includes the rules regulating the exercise of these rights.

The said decision must be issued within a maximum of fifteen days from the date the competent general management receives such complaint and must be executed and continue to be executed at the respondent's cost until the competent court issues a final decision on the said rights.

Article (25):

Where it is not possible for a landlord to adequately irrigate or drain his land except by erecting or using a private *Mesqa* or a private drain or a private groundwater well located in a land owned by another person and he fails to reach an agreement with the owners thereof, the competent general manager shall upon filing a complaint by such landlord, order an investigation into the complaint.

The competent administrative department shall, within a maximum of two weeks from the date the competent general manager receives the complaint, order to furnish such maps and documents as may be necessary for deciding on the complaint. The competent inspector shall conduct the investigation at the site of the *Mesqa* or drain after all parties concerned, the chairman of the concerned agricultural cooperative, and the head of the union or association of water users are notified by registered mail, return receipt acknowledged, of such place and date as may be designated by the competent inspector fourteen days at least before moving to the said site.

The findings of the investigation are submitted to the competent general manager to issue a grounded positive or negative decision. The decision must be issued within two months from the date the maps and documents are furnished and must be communicated to all the interested parties by registered mail, return receipt acknowledged. The above provisions apply where there is a request to erect a water-lifting machine on, or dig a groundwater well in, the lands of another person at the water intake or outflow, or in the water stream used for irrigating or draining a land separate from the water intake or outflow.

Article (26):

Where a channel for irrigating or draining a land is changed or blocked for public interest, the competent general manager shall issue a decision to erect another channel for irrigation or drainage in accordance with the procedures mentioned under Article (25) and the decision is enforceable at the cost of the body which has caused such change before the irrigation or drainage channel is blocked.

Article (27):

A decision issued in accordance with Articles (25) and (26) is enforced by administrative ways after paying damages to all affected persons. If the decision permits the use of an existing private *Mesqa* or a private drain or a groundwater well, the indemnity must include a part of the estimated erection costs at the time of use calculated in proportion to the area of the land benefiting from the same. If the interested person refuses the determined indemnity or if it is not possible to pay it to him, the indemnity is deposited in an account in his name with the treasury of the competent inspection department and he is so notified by registered mail, return receipt acknowledged. Depositing the indemnity is deemed as if the indemnity has been satisfied.

Article (28):

Where a decision is issued in accordance with Articles (19), (24), (25), (26), and (27) in favor of more than one person, the competent general management may authorize one or more than one of them to execute the decision on behalf of the other persons. The person in whose favor the decision is issued may have recourse on the other persons in respect of the costs each one of them bears in proportion to the area of his land.

Article (29):

Where the competent general manager finds that a private *Mesqa* or a private drain or a private groundwater well is useless because there is another channel for irrigation or drainage, he may decide to block it or stop its use or remove it.

If a damage is proved to be caused by a private *Mesqa*, or a private drain or a private groundwater well, the competent general manager shall take the necessary action to prevent the damage and the owners of the stream or the well shall implement the decision at such date as may be determined by the competent general manager, otherwise, the competent general department may take such action at the cost of the said owners.

Article (30):

The provisions of the articles (19) to and through (29) apply to the joint methods and systems of improved irrigation and drainage including the booster stations; the suction and delivery pipes; the valves; the title drain network pipes and the like; and groundwater wells.

Article (31):

An interested person may complain to the Minister of Water Resources and Irrigation of the decisions issued by the competent general manager except for the decisions issued in accordance with the provisions of Article (19) and (24) provided that such complaint is filed within fifteen days from the date the interested person is notified of the decision. Filing a complaint gives rise to the suspension of the decision unless the decision provides that it is immediately effective.

A final decision on the complaint is given within sixty days from the date the complaint reaches the Office of the Minister. If the Minister does not decide on the complaint during that period, the complaint is deemed rejected.

PART III

WATER DISTRIBUTION

Chapter (1)
Water Management and
Water Distribution Regulation

Article (32):

The Ministry of Water Resources and Irrigation is authorized to manage and regulate the distribution of water from all sources for all the uses indicated under Article (2), paragraph (b) of any kind whatsoever on private intakes and openings. The Ministry may determine or modify the purposes of water uses. The Ministry determines the

dates of rotations of any kind. The details of these dates are announced by administrative ways by each local competent general management.

The Ministry of Water Resources may assign a specialized company or a union or an association or a board of water users to manage, operate, and maintain parts of irrigation and drainage networks; groundwater wells; joint reservoirs; methods and means of improved irrigation; at the cost of the users. The water union, associations, and boards act independently and are created, formed and given responsiblities by a decision issued by an authority to be determined by the Minister of Water Resources and Irrigation in each governorate and in accordance with the executive regulations of the law.

Article (33):

Where an emergency so requires for the public interest, the competent general manager may order at any time even during on-periods that no water be taken from a public canal(s) or irrigation groundwater well(s) to ensure that the water is fairly distributed or that no excessive water be given or wasted to farmed lands.

The competent general management may take the necessary procedures to prevent the violation of the decisions issued pursuant to the previous paragraph; and may, in particular, prevent by administrative ways the passage of water into a *Mesqa* or its branches and obstruct by appropriate method the water lifting.

Article (34):

No rice may be planted in lands other than the canal command areas licensed annually by the Ministry of Water Resources and Irrigation within the limits of the percentages determined for each canal. No rice also may be planted in the lands irrigated by the groundwater wells or public drains except by license form the competent general management in accordance with the conditions determined by the Ministry. No water-consuming crops may be cultivated except with license from the Ministry of Water Resources and Irrigation, after consultation with the Ministry of Agriculture and Land Reclamation.

Chapter (2)

Water Intakes and Drain Outflows

Article (35):

No water intakes regardless of their purposes may be erected on the High Dam Lake, or the River Nile, or public canals and drains and no groundwater wells may be dug except by license from the Ministry of Water Resources and Irrigation and in accordance with such conditions as may be determined by the Ministry. Any works erected beneath the Nile banks by the comptent general department are paid for by the respective licensee.

Article (36):

If the competent general department finds that the discharge of a private intake or a groundwater well is more or less than the actual quantity required for its intended actual purpose, the department may after identifying the points of view of the water users make the required modification at such date as it may determine to achieve its intended purpose. The General Manager approves the final modification provided that it becomes enforceable at the appropriate dates for cultivation.

Article (37):

Where the competent general department, after conducting an inspection, finds that a private water intake on the Nile, a public canal, a public drain, or a groundwater well causes damage to an embankment or a channel or an installation or to another person because of a defect in its erection, or neglect of its maintenance, or for any other reason, the competent general department shall within such period as it may determine notify the interested persons of the required works. If the interested persons fail to do the required works, the competent administrative department may at the expense of the landlord renovate, re-erect, or make the necessary modifications to the water intake.

Article (38):

If the competent general department finds that a private intake on the Nile or on a canal, or on a drain, or on a groundwater well causes damage to an embankment or an installation, the competent general department may instruct the landlord or the interested person to remove or block such intake at a reasonable time to be communicated to him, otherwise, the competent general department, after arranging another method for irrigating his land at the State's cost and before blocking the irrigation channel, executes the same at the expense of the landlord or the interested person.

Article (39):

Were there is more than one channel to irrigate an area, the competent general department shall order the cancellation of the use of excess channels after interested persons are so notified.

Article (40):
If the State takes at its own expense the necessary measures to supply water from the Nile or a public canal or a well to a land irrigated from a private intake from the Nile or the main canals or a public canal or a well, the competent general department shall order the cancellation of the use of such intake or its removal at the State's expense.

Article (41):

The provisions of this chapter apply to the openings made on the Nile or the public drains and canals, or the drainage wells to drain water into the Nile or into a public drain or into the ground.

Chapter (3)
Water-Lifting Machines

Article (42):

No pumps or equipment driven by a fixed machine or by a mobile mechanical automated device or by any other method may be erected or operated without license from the competent department to lift water from the High Dam Lake or the Nile River or the public streams or groundwater wells or reservoirs whether for purposes of irrigation or drainage or drinking or industry. The applicant for the license shall pay such fee as may be determined by a decision of the Minister of water Resources and Irrigation.

Article (43):

Where a pump or equipment or a machine or the accessories thereof are to be installed on a land not owned by the license applicant, he shall obtain a written permission from the landlord. But if the pump or machine or equipment or the accessories thereof are to be installed on a private *Mesqa*, or a private drain, or wells or reservoirs of mutual use, the permission is given by the competent general department provided that the licensee does not prejudice the rights of the other users. The competent general department is entitled during the license period to deactivate the pump or the equipment for a specific period for the interest of the other users but the licensee has no right to claim damages.

Article (44):

Where a machine or a pump or equipment is replaced, a new license must be obtained if such replacement leads to a change of the discharge, or if locations are changed. But, where ownership is transferred or a machine or equipment or a pump is replaced without change of the discharge, the same is only instructed in the license certificate and the previous owner remains jointly liable with the new one for implementing the provisions of this law until the same is instructed in the license certificate.

Article (45):

A person who trades in water-lifting equipment used for irrigation or drainage mentioned under Article (42) shall notify both the Mechanical and Electrical Department and the Irrigation Department of each sale or disposition of such equipment within fifteen days from the date of disposition of the equipment. The notice must contain such other details as may be determined by the Minister of Water Resources and Irrigation.

Article (46):

There may not be erected, without license from the competent general department in accordance with such conditions as it may determine, any water wheels or scoop wheels or any other machines driven by cattle to lift water from the Nile or from a public or private stream of mutual use or to drain the drainage water into the Nile or into a public drain or a basin listed under Article (3) hereof. A license concerning these machines is not limited to a specific period. The applicant for license shall pay such fee as may be determined by decision by the Minister of Water Resources and Irrigation.

Article (47):

There may be, without license from the Ministry of Water Resources and Irrigation, installed and operated *Shadoofs*, drums, and other manually-operated water-lifting machines provided that such machines are not installed within the constructions of the public canals or public drains or the Nile banks and its branches thereof.

Article (48):

A license to install a machine in accordance with the provisions of this law does not exempt from obtaining any license required by other laws.

The Ministry of Water Resources and Irrigation may decide to do the following at the State's cost:

- move any authorized pump or equipment;
- change the site of an authorized groundwater well or dam;
- move the works erected for such purpose to another location to protect the banks and irrigation and drainage installations;
- erect new works; or
- modify existing works of public benefit.

Article (49):

If a license requires doing additional works necessary for taking or draining water, such works are done at the expense of the license applicant.

Article (50):

A person licensed to erect a water-lifting machine shall enable all users listed in the license to use the machine subject of the license.

Article (51):

Granting a license does not give rise to any right for the water to pass through the lands of a third party. The licensee alone is held liable for any act or deed causing damage to a third party. If the Nile stream is detoured, thus, forming an island or river alluvial deposits towards a land on which an authorized water-lifting machine is erected, the licensee is entitled without paying any damages to dig a *Mesqa* in the new land to permit the water to reach such machine.

Article (52):

The competent general manager may when necessary deactivate a machine operated in violation of the provisions of this law or prevent the water from reaching the machine without having to wait for a determination on the violation.

Article (53):

The Minister of Water Resources and Irrigation or whomever he may delegate may issue a grounded decision canceling a license if the conditions thereof are violated.

PART IV

DEVELOPING AND IMPROVING
IRRIGATION AND DRAINAGE SYSTEMS

Chapter 1

Developing Surface Irrigation Systems

Article (54):

Without prejudice to the provisions of the articles under Part II of this law, improved irrigation systems are applied in accordance with the plans and policies adopted by the Ministry of Water Resources and Irrigation in the old lands irrigated by surface flood irrigation through networks of canals and *Mesqa*s.

Article (55):

The Minister or Water Resources and Irrigation or whomever he may delegate shall define by decision the command areas where private *Mesqah*s must be developed by applying improved irrigation systems in accordance with the field technical and social studies conducted by the Ministry's Division for Irrigation Improvement. The Ministry's decision is binding by operation of law to all the parties involved in the improvement process including the farmers, the landlords, and the landholders.

Article (56):

The Ministry of Water Resources and Irrigation shall regulate by decision the method of managing and using improved irrigation systems in the old lands. The systems are applied by establishing unions and associations of the water users and water boards acting independently.

Article (57):

The costs of improving the private *Mesqa*s and their contents in the old lands are collected after the Ministry of Water Resources and Irrigation determines the costs of their construction in accordance with the rules described under Article (62) of this draft law.

Article (58):

There continues the activity of the Special Fund for financing the projects for the development and maintenance of the improved *Mesqa*s in the old lands, created by virtue of Article (36), bis (1), of the law No. 12 of 1984 as amended by law No. 213 of 1994. The purposes of the Fund are to supervise the implementation of these projects; increase awareness in the field of water use; and assist the associations and unions of water users and water councils to achieve their objectives.

The Fund's resources are obtained from the appropriations allocated for the Fund in the State's general budget; the proceeds of loans, grants, and installments paid by the landlords for the improvement projects; and the Fund's investment returns.

The Minister of Water Resources and Irrigation shall determine by decision the rules regulating the Fund's financial policy, and the formation of its board of directors made up of representatives of the associations and unions of water users and the water councils.

Article (59):

No pumps may be operated on the improved *Mesqa*s other than the pumps of the associations and unions of water users.

Chapter 2

Improving and Developing

Drainage Systems

Article (60):

The drainage systems in the agricultural lands in the Arab Republic of Egypt shall be improved and developed in accordance with the plans and policies of the Ministry of Water Resources and Irrigation. The Minister of Water Resources and Irrigation may by decision temporarily take possession of the lands necessary for the construction of the open and tile drainage network. The Minister also may take the necessary procedures to expropriate the ownership of these lands in accordance with the provisions of Law No. (10) of 1990 concerning property expropriation for the public interest and the executive regulations thereof.

Article (61):

Without prejudice to the provisions of law No. 38 of 1976 concerning agricultural land improvement and maintenance, the Ministry of Water Resources and Irrigation shall erect, replace, and rehabilitate the network of tile field drains and tile or open collectors so that all the lands included in the drainage unit can be connected by a series of public main and subsidiary drains. The cost of the erection, replacement, and rehabilitation of the tile drainage network and the accessories thereof are divided on all the lands located in the drainage unit.

Article (62):

The Ministry of Water Resources and Irrigation shall make a statement of the costs of erection of the tile field drains or improved *Mesqah*s. An amount equivalent to 10 % of the erection cost is added as an administrative fee. The statement indicates the part of the cost of each feddan of the lands included in the drainage or irrigation unit. The costs of the field drain or field irrigation networks are born by the landlords.

A landlord may pay the amounts referred to under the previous paragraph either at one time or in annual installments provided that all costs must be paid within a period of no more than twenty years and that the amount of each installment must not be less than twenty pounds. The payments are collected starting from the first year following

the implementation. The Ministry of Water Resources and Irrigation shall send to the competent bodies a statement indicating the basins included in the drainage or irrigation unit and the amounts to be collected per feddan. The Minister of Finance shall regulate by decision the collection of these amounts at the same dates fixed for the collection of the land tax and such amounts have the same precedence right decided for the land tax.

A statement on the part of the cost to be paid by each landlord is posted for two weeks at least at the principal office of the agricultural cooperative and on the notice board at the municipal council or the local police station where the lands exist. Before the statement is displayed, a notice on the date and place of its display must be announced in the Egyptian gazette. Interested persons may within the thirty days following the end of the display period may complain of the cost amount, otherwise, the estimated cost becomes final. Complaints must be filed with the competent inspector at the local land registry office and are decided on by a committee formed for this purpose. The Committee is chaired by the competent inspector or acting inspector of the local land registry office and comprises representatives of the Ministry of Agriculture and the local cooperative; a specialist from the local land registry office, and an engineer of the Ministry of Water Resources and Irrigation.

The Committee's decision may be challenged before the competent court of first instance but the challenge does not give rise to the suspension of the enforcement of the decision.

Article (63):

The Ministry of Water Resources and Irrigation shall - within one year from the date of the erection of the tile or open drainage network, or of the public drainage network or of the improved irrigation network - notify the Real-estate Tax Authority of the lands in which the network is erected to re-estimate the tax on these lands.

Article (64):

The Minister of Water Resources and Irrigation shall by decision regulate the method of managing and using the tile drainage systems by the farmers by way of creating unions with corporate personality made up of the users of tile drainage collectors. The unions are responsible for managing and maintaining the tile drainage networks within the boundaries of the land of the collector.

Article (65):

The unions of the users of the tile drainage collectors shall perform the periodic and general maintenance within the boundaries of the land of the collector, otherwise, the

competent general department carries out such maintenance in accordance with the provisions of Article (20) and (21) of this law.

Article (66):

There is deemed a violator, a person who causes damage to the industrial works of both types of the tile drainage network such as inspection holes, washing units, and outflows. This includes damage caused by:

- destroying parts of the industrial works;
- stealing components of the industrial works;
- filling the drain network with earth;
- throwing scrap into it;
- draining irrigation water into it;
- connecting the drain network with sanitary or industrial drainage; or
- erecting any installations on it.

Without prejudice to the provisions of the penal code, where a violator's act causes damage to a third party, the competent engineer shall prove any violation described under this article and may instruct the violator to restitute the thing subject of the violation within such short period as the engineer may determine, otherwise, the competent general department makes restitution at the violator's expense.

Article (67):

There is hereby created a Special Fund to implement, replace, renovate, and maintain the tile drainage projects. The Fund's resources are obtained from the appropriations allocated in the State's general budget; the proceeds of loans, grants, and installments paid by the landlords; and the Fund's investment returns.

The Minister of Water Resources and Irrigation shall determine by decision the rules regulating the Fund's financial policy and the formation of its board of directors made

up of representatives of the associations and unions of the users of tile drainage collectors.

PART V
IRRIGATION OF NEW LANDS

Article (68):

For the purposes of this Chapter, there are deemed new lands every land not previously licensed to be irrigated under the provisions of this law, whether it being inside the valley, Delta, or in any other place inside the Arab Republic of Egypt, and allocated water resources in the State's plan.

Article (69):

No land may be allotted for horizontal agricultural expansion without the approval of the Ministry of Water Resources and Irrigation to make sure that a water source is available for its irrigation as may be determined by the Ministry.

Article (70):

No land may be sold or allotted for agricultural development purposes by any ministry or body to any individual or group or company or association except after indicating the purpose of sale or allotment and after the Ministry of Water Resources and Irrigation determines that there are enough sources of water to irrigate and cultivate such land on a permanent basis. The Ministry my determine the quantities of water necessary for the other activities; such as industrial, commercial, tourist, or other purposes.

Article (71):

The Minister of Water Resources and Irrigation or whomever he may delegate is authorized to issue licenses to irrigate the new lands. The licensee shall follow such irrigation method as may be described in the license. If the licensed irrigation method

is not complied with, the department issuing the license may execute the licensed irrigation network at the landlord's or landholder's cost, as the case may be, and collect the cost thereof by administrative way or by the procedures provided under Article (62) of this law.

Article (72):

Unless otherwise specifically provided in this law concerning the irrigation of the new lands, all the other provisions of this law govern the irrigation of new lands.

Article (73):

For the purpose of enforcing the provisions of this Chapter, the Minister of Water Resources and Irrigation shall define by decision:

- the terms and conditions for licensing the irrigation of new lands;
- the costs and charges for water supply and distribution; and
- the method of establishing corporate water user associations and water councils.

PART VI
GROUNDWATER

Article (74):

No groundwater well, deep or shallow, may be dug in the Arab Republic of Egypt except with license from the Ministry of Water Resources and Irrigation in accordance with such conditions as may be determined by the Ministry. Where a well has to be dug in a land governed by the provisions of law No. 143 of 1981 concerning the desert lands, there must be issued a license by the Ministry of Water Resources and Irrigation. No contractors, companies, or individuals engaged in digging groundwater wells may contract to dig wells without license from the Ministry of Water Resources and Irrigation.

Article (75):

A person licensed to dig a well may not violate the license conditions concerning the use of the well or exceed the rates and quantities of the licensed water.

Article (76):

A license to use a well is issued and renewed by the local competent general department.

Article (77):

A license to use a well is withdrawn or cancelled if the well is not used within three years from the date the license is issued or if the well is used for purposes other than those for which the license is issued.

Article (78):

The Minister of Water Resources and Irrigation shall regulate by decision the procedures, methods, and conditions for digging wells.

Article (79):

The Minister of Water Resources and Irrigation shall regulate by decision the methods to be adopted by the Ministry in managing and using the wells by way of establishing water councils and associations of water users.

Article (80):

The Minister of Water Resources and Irrigation shall define by decision the wells and *Mesqa*s for which charges are collected for their erection, management, and maintenance.

Article (81):

There is hereby created a Special Fund for financing the erection of wells; the distribution of their water to the desert; increasing awareness about the preservation of the groundwater; and assisting the well user associations to manage, distribute the water of, maintain, replace, and rehabilitate such wells.

PART VII
CHARGES OF PUMPS
AND WATER-LIFTING MACHINES

Article (82):

The Minister of Water Resources and Irrigation shall by decision determine the charges to be paid for irrigating and draining water by the State's pumps and machines unless the land tax is estimated on the basis of the free of charge use of irrigation and drainage facilities.

Article (83):

The Minister of Water Resources and Irrigation shall by decision determine the charges to be paid for irrigation by the licensed special machines erected on groundwater wells or on the Nile or public canals or drains including the booster pumps, private *Mesqa*s, and the charges for drainage by using lifting machines. No charges may be collected more than the fixed charges and if charges in excess of the fixed charges are collected, such charges must be refunded. Charges in excess may be proved by all means of evidence regardless of the disputed amount of charges.

Article (84):

A person licensed to use or exploit the water of the Nile, canals, groundwater wells, reservoirs, or flowing springs for purposes other than agricultural purposes whether for transportation or navigation or industrial activity or generating electricity or drinking or any other purposes shall pay a fee for maintaining, operating, and managing the utility in accordance with such rules and rates as may be determined by

the Minister of Water Resources and Irrigation. A person licensed to drain water resulting from an activity other than the agricultural activity into the Nile or groundwater or drains shall pay such charges as may be determined in accordance with rules and rates laid down by decision of the Minister of Water Resources and Irrigation.

Article (85):

A user of a groundwater well or a lifting machine may not cease to irrigate or drain water from the lands for which a license is issued and may not, unless there are serious reasons, cease to use such wells or the machines licensed for this purpose.

Article (86):

Where the provisions of the previous article are violated, the competent general manager may entrust the well or the lifting machine temporarily with a person designated for this purpose at the licensee's expense and the persons concerned may complain of such decision to the Minister of Water Resources and Irrigation who has only thirty days to decide on the complaint, otherwise, the complaint is deemed rejected.

PART VIII
PROTECTION OF WATER RESOURCES, STRUCTURES, NAVIGATION, AND SHORES

Chapter 1
Protection from
High Water Level Threats

Article (87):

The Minister of Water Resources and Irrigation may, by decision, announce a State of Emergency if the water level reaches abnormal height, or when abnormal flood occurs, or when the groundwater surges under high pressure or failure of water

structures and embankments; thus, requiring implementing works for urgent protection in accordance with the emergency plan laid down by the Ministry of Water Resources and Irrigation for fending off the water threats and protecting the dams, reservoirs, and embankments.

Article (88):

Where a State of Emergency referred to under the previous article occurs, the competent general manager may call strong men between 18 and 50 years of age to participate in watching and observing the Nile embankments, public canals, public drains, and flood plains; filling in the resulting cracks of these embankments; and implementing the necessary works for protecting the embankments and other water resources from such danger. The chiefs of police departments shall take the necessary measures to facilitate the mobilization of these persons and transporting them to the sites where there are dangers of water floods. The Minister of Water Resources and Irrigation determines by decision the appropriate remuneration for the persons assigned to help.

Article (89):

Where there is a risk of water outflow, each engineer assigned to supervise the watch and observation of the embankments and the water resource installations may immediately request the chief of the police department in his governorate to call the persons referred to under the previous article without need for the Minister of Water Resources and Irrigation to announce by decision a State of Emergency provided that the Ministry is so notified.

Where a danger occurs and in the absence of superior officials, the mayor or acting mayor may call such persons in his town to provide the needed assistance to fend off the danger from an adjacent town, but the mayor shall immediately report to the chief of the police department in his governorate; the chief of the county police department or of the local police station; and the competent general department which shall so notify the Ministry.

Article (90):

The competent engineer authorized to act under the previous article may temporarily take possession of any land or tools; dig any holes; demolish any buildings; cut any trees; or eradicate any plants but the Ministry of Water Resources and Irrigation shall pay appropriate damages for such act.

Chapter 2
Protection of Water;
Removing Obstacles of
Irrigation, Drainage, and Navigation

Article (91):

No person may:

1. Waste or squander water resources by draining water into a private drain or a public drain, an uncultivated land; a land not licensed to be irrigated; or by using an unlicensed method of irrigation; thereby, misusing water; or by using more water in lands not licensed to be cultivated by rice or any other water-consuming crop.

2. Drain into the High Dam Lake whether from the lands, installations, or cruising river units.

3. Transport toxic or hazardous materials, as identified by Ministries of Environmental Affairs and Health, by river transportation units through the navigation waterways.

4. Inject liquid wastes or dump solid scrap; thereby, polluting the groundwater.

5. Establish fish farms and breeding boxes in the Nile stream and its branches extending to Edfina and Faraskour barrages, or in the main canals, public canals, and freshwater lakes.

6. Erect installations in the flood plains.

7. Drive wedges to link nets on the embankments of a public canal, a public drain, or in their beds; or on the embankments of a barrage basin, a water lock; a bridge, or a dam erected on the Nile or the branches thereof; or in any other canal or public drain or flood plain.

8. Obstruct the course of water in a public canal, a public drain, a flood plain, or make any other work that would affect the balances.

9. Open or close any water lock, barrage, or any other works intended to balance the movement of the current water, which are erected in a public canal, a public drain, or on the embankments of the Nile, a public canal, or a public drain.

10. Break any damage to an industrial works of the Ministry of Water Resources and Irrigation.

11. Break the Nile embankments, public canals, public drains, or flood plains.

12. Dig in the Nile embankments, public canals, public drains, or flood plains or in their beds, or in the slopes or berms of any of these embankments.

13. Move earth or stones or any other materials or equipment from the Nile embankments, sides, or berms; or from the embankments of a public canal, a public drain, a flood plain, or from an industrial work or any other work inside the public properties pertaining to the water resources.

14. Throw mud or dust or any other material in the Nile and its Branches, or in a public canal, a public drain, or on their embankments; or on the embankments of the Nile or flood plains; or making any works that would affect the quality of the surface water and groundwater.

Article (92):

The following acts may not be done except with license from the Ministry of Water Resources and Irrigation:

1. Drain into a public canal, a public drain, groundwater, or a flood plain.

2. Irrigate lands with the water of agricultural, sanitary, or industrial drainage, without contradiction to law 48/1982 concerning protection of waterways, and law 4/1994 concerning environment protection and their executive regualtions.

3. Dig groundwater wells to use their water in irrigation, drinking, industrial activity, or in any other purposes.

4. Drive a heavy-weight moving machine on the embankments or industrial works of the Ministry of Water Resources and Irrigation if this would cause damage to the embankments or industrial works.

Article (93):

Where a barrage erected on the Nile, a public drain, or a public canal is blocked or fails to function because of lack of water in any of the above-said streams or due to the maintenance works of the water installations, the owner of a boat or of the cargo thereof may not claim damages from the government for such delay.

Article (94):

Where a boat collides, sinks, or fails to move because of lack of water in the navigation route, the owner or captain thereof shall immediately so notify the nearest police station, which shall make a report to establish the state of the boat and its cargo. The report is then sent to the competent general department, which shall instruct the boat owner, cargo owner, or the boat captain to remove the boat or its debris within three days, otherwise, the department takes this action.

If the competent general department finds that it is in the public interest to remove the boat or its debris immediately, it may do so without being restricted to the previous procedures and no damages may be claimed from the State for any damage caused to the boat or the cargo thereof during its removal by the competent general department. In all cases, the boat owner and the cargo owner are jointly liable for paying to the competent general department the removal's cost and the department is entitled to seize the boat and/or its cargo in guarantee to obtain these costs for such period as it may determine, or it may sell the boat and/or its cargo by public auction.

Article (95):

It is not allowed for any kind of floating houses to anchor on the banks of the Nile or its branches or public canals or public drains or in any public stream for operating ferry boats without obtaining a license from the Ministry of Water Resources and Irrigation in each case in accordance with such conditions as it may determine.

Chapter 3

Sea Coast
Management and Protection

Article (96):

Without prejudice to law No. 4 of 1994 concerning environment protection, no installations may be erected on the coasts along the Mediterranean Sea, Red Sea, Gulf of Suez, or the western coast of Aqaba Gulf for a distance of two hundred meters wide in land from the coastal water line except with license from the General Egyptian Authority for Coast Protection.

Article (97):

The General Egyptian Authority for Coast Protection shall define the final prohibition line in view of its studies in this respect. Once the line is defined, it becomes the final line and may not be violated by erecting any installations. The prohibition provided under Article (96) continues in force until the Authority determines the final line and all bodies concerned are so notified. The line stated under Article (96) is, then, cancelled.

Article (98):

In case of great emergency where it is necessary to erect installations of a special nature inside the prohibition area referred to under Article (96), a prior approval by the General Authority for Coast Protection is required. An approval licensing the erection of an installation must determine the required protection works, and the due fees provided in the executive regulations of this law must be paid.

PART IX

PENALTIES

Article (99):

Without prejudice to any tougher penalty provided in the penal code or any other law, the violation of this law is punishable by the penalties described under the following articles:

Article (100):

A person who violates a provision provided under section (c) of Article (4) and Articles (8), (20), (47), (59), (92), and section 7 of Article (91) is punishable by a fine of a minimum of 500 Egyptian pounds and a maximum of 3000 Egyptian pounds and in case of recidivism, the penalty is doubled. Also a person who violates article 95 should be either punicshable by a fine given in article (100) or by bringing into halt the floating houses or the floating boat till getting a license.

Article (101):

A person who violates a provision provided under Articles (10), (19), (35), (44), (45), (46), and section 1 of Article (91) and Article (94) is punishable by a fine of a minimum of 1000 Egyptian pounds and a maximum of 3000 Egyptian pounds.

Article (102):

A person who violates the provision of Article (9) by cutting trees and palms without license from the Ministry of Water Resources and Irrigation is punishable by a fine of a minimum of 30 Egyptian pounds and a maximum of 200 Egyptian pounds.

Article (103):

A person who violates a provision provided under Articles (24), (25), (39), (42), (43), (50), (66), (83), and (85); sections 5, 6, 8, 9, 10, 11, 12, 13, and 14 of Article (91); and the decisions issued in accordance with Article (52) is punishable by a fine of a minimum of 5000 Egyptian pounds and a maximum of 10000 Egyptian pounds.

Article (104):

A person who violates the provision of Article (34) is punishable by a fine of a minimum of 1000 Egyptian pounds and a maximum of 5000 Egyptian pounds per feddan or a fraction of feddan.

Article (105):

A person who violates the provision of Article (74), and sections 2, 3, and 4 of Article (91) is punishable by a fine of a minimum of 10000 Egyptian pounds and a maximum of 50000 Egyptian pounds. The violation of Article (75) is punishable by a fine of a minimum of LE 1000 and a maximum of LE 5000. Imposing the penalties provided for the violation of Articles (74) and (75) and section 2 of Article (91) does not prejudice the right of the Ministry of Water Resources and Irrigation to make restitution at the violator's expense.

Article (106):

A person who violates the provision of Article (70) is punishable by a fine of a minimum of 10000 Egyptian pounds whether the violator is a landlord, a landholder, or a squatter.

Article (107):

The engineers of the Ministry of Water Resources and Irrigation designated by a decision of the Minister of Justice with the consent of the Minister of Water Resources and Irrigation have, each within his respective jurisdiction, the capacity of law enforcement officers in respect of the crimes provided in this law, which occur in their respective jurisdictions.

Article (108):

Where there is a trespass on the installations of the water resources, the engineers of the Ministry of Water Resources and Irrigation may within the limits of their respective jurisdictions order restitution by the trespasser or the beneficiary of this trespass within such time as they may determine. If the trespasser fails to make restitution, the Ministry makes restitution at the expense of the trespasser or the beneficiary after so notifying him by registered mail, and in case of emergency, by a signal served by the local police station provided that these procedures are established in a report on the violation written by the competent engineer.

If the trespasser or the beneficiary does not make restitution within the specified period, the competent general manager removes by an administrative decision the trespass without prejudice to the penalties provided in this law. The trespasser or the beneficiary is notified of the cost of restitution and shall pay such cost within one month from the date he is so notified, otherwise, the Ministry of Water Resources and Irrigation collects the same by way of administrative attachment.

Article (109):

A person who violates the provisions of Articles (96), (97), and (98) of this law is punishable by imprisonment or a fine of a maximum of 50000 Egyptian pounds and the enforcement of the penalty may not be stayed. In all cases, the violating works must be stopped by administrative way at the violator's expense and the machines, tools, and equipment used in committing the violation must be seized without having to wait until a judgment is delivered on the case. If a violator is found guilty, the competent court may forfeit the machines, tools, and equipment used in committing the violation.

Article (110):

Without prejudice to the penalties determined in this law, a person who violates the license conditions for irrigating new lands shall pay damages for the quantities of water used in excess of the authorized quantities in accordance with such rules as may be determined by the Minister of water Resources and Irrigation. The damages may be claimed through administrative channels

PART X

General and Final Provisions

Article (111):

Town and village mayors shall keep and maintain the water resource industrial works delivered to them in accordance with the conditions agreed upon between the Ministry of Water Resources and Irrigation and the Ministry of Interior and shall notify the competent authorities of any loss of the same immediately when such loss is discovered.

Article (112):

Without prejudice to the provisions of law No. 10 of 1990 concerning the expropriation of property for the public interest and the executive regulations thereof, the disputes concerning claims for damages provided in this law are heard by a committee formed in each governorate. The Committee is presided over by a judge delegated by the chief judge of the court of first instance in the respective governorate and comprises the deputy heads or acting deputy heads of the competent general department, the land registry office, and agriculture department in the respective governorate in addition to a representative of the governorate selected by the respective governor. The meeting of such Committee is valid only if attended by its chairman and at least two of its members. The Committee's decision is issued within one month from the date of its first session by a majority vote and in case of equal vote, the chairman has a casting vote. The Committee's decisions may be challenged before the competent court of first instance, but the challenge does not result in the suspension of the decision enforcement.

Article (113):

The capital of the Special Restitution Fund created under Article 103 of law No. 12 of 1984 concerning irrigation and drainage, before the law is repealed, is increased to ten million Egyptian Pounds (L.E. 10.000.000). The Fund is allocated to cover restitution costs if the beneficiary fails to make restitution. The entire fees, fines and indemnities decided pursuant to this law accrue to the Fund.

The Minister of Water Resources and Irrigation shall regulate by decision the Fund's rules, the formation of its board of directors, and its financial regulations.

Article (114):

All the amounts of money which fall due to the State under the provisions of this law have precedence right on the debtor's property pursuant to the provisions of Article 1139 of the civil code but such debt rank second after the court's cost and is satisfied by way of administrative attachment.

Article (115):

The Minister of Water Resources and Irrigation shall determine by decision the rules regulating cost sharing by water users for installing water projects and structures.

Article (116):

The crimes contained in this law are heard by a committee established in each summary court. The committee is chaired by the court judge and comprises the competent works manager selected by the undersecretary for Water Resources and Irrigation in the respective governorate; a member of the respective municipal council selected by the head of municipal unit in the respective governorate; a police officer selected by the director of the police department in the respective governorate; and a member of the councils, boards, unions, or associations of water users selected by the undersecretary for water resources and irrigation in the respective governorate. The Committee issues its decision after hearing the persons it may think necessary within one month from the date of its first session.

APPENDIX C

EXPLANATORY NOTE OF A DRAFT LAW ON WATER RESOURCE MANAGEMENT (IN ARABIC)

APPENDIX D

PROPOSED MODIFICATIONS IN LAW 12/1984
(IN ARABIC)

APPENDIX E

STAKEHOLDER WORKSHOP REPORT

1. PURPOSE OF WORKSHOP

The main objective of the workshop were to:

- Solicit stakeholder feedback on the proposed modifications to law 12/1984, the fundamental law that concerned irrigation and drainage. It is now retitled to address water resources management.
- Review and discuss proposals being developed to improve compliance with Law 12/1984 on water resources management.
- Glean opinion and perspective from a broad range of stakeholders regarding the revision of Law 12.
- Identify other initiatives, which might contribute to improve water resources management.

A total of 50 stakeholders participated in the workshop. There were several ministries other than MWRI, NGO and farmer representatives. Names and institutions of participants are enclosed. The meeting proceeded according to the Agenda (enclosed). Eng. Ali Morsi, undersecretary MWRI and Chairman of Irrigation Department chaired the meeting and Dr. Amr Mousa acted as the facilitator. Eng. Ali Morsi, in his opening speech, explained the need for the amendment of Law 12/1984 and emphasized the importance of the stakeholders' comments on the modifications proposed by WPAU/EPIQ group.

Engineer Ahmed Maher, EPIQ short term consultant, and Dr. Mohamed Badran, legal advisor explained the modifications proposed and presented the new articles that were added.

2. WORKSHOP DISCUSSIONS

Following presentation of the principles and strategy of proposed amendments, there ensued a full day of discussions and information sharing. Other ministries representatives discussed articles that are relevant to their authorities. The general issues raised were:

- Highlight the concept of integrated management.
- Define the responsibilities and authorities of the governmental and non-governmental bodies at all central, regional and local levels.
- Encourage participation of water users and private companies in water resources management.
- Merge law 12/1984 on irrigation and drainage and law 48/1982 on water quality.
- Consult MALR on areas of land to be cultivated with rice and other high water consuming crops.
- Expand the use of groundwater and drainage water for irrigation purposes.
- Continue improving the surface irrigation system in the old lands.
- Toughen the penalties for the violations of the law.

3. CONCLUSIONS DRAWN FROM THE STAKEHOLDER COMMENTS

The workshop was designed to provide an opportunity for stakeholders and other interested parties to comment on the adequacy of the proposed changes in Law 12/1984 and its supplementary Law 213/1994.

The results of the brainstorming process pointed out a number of additional major concerns that need to be addressed in revision of Law 12/1984. Major conclusions drawn from stakeholders meeting were:

- Law enforcement officials need protection.
- Coordination between the Ministry of Water Resources and Irrigation and Ministry of Agriculture and Land Reclamation on defining the areas designated for crops.
- Preserving water is important in dealing with improved irrigation.
- Protection of Lake Nasser from pollution is essential.
- The necessity for referring to law 48/1982 on water quality in the proposed law.
- A quick authority should be given to the water councils.
- Toughening penalties for water pollution.
- Penalties for extending land into a canal need to be stronger.
- Designating groundwater wells for drinking water.
- Coastline has to be defined and building on an area of 200 m width should be prohibited.
- Water Users Association and Drainage boards could be merged.

At the end of the meeting, Eng. Ali Morsi gave the participants a period of time of 10 days within which to send additional written comments to MWRI. A number of serious comments were received. These comments were critically examined and included in the proposed modifications in the law.

LIST OF PARTICIPANTS

LAW 12/1984 STAKEHOLDERS WORKSHOP
MONDAY NOVEMBER 6, 2000
CONRAD HOTEL

♦ MINISTRY OF WATER RESOURCES AND IRRIGATION

- Eng. Ali Morsi
- Eng. Mohamed Fathi
- Eng. Maher Khodary
- Eng. Abdel Moneim Shalaby
- Dr. Mohaed Dia EL Kosy
- Dr. Fatma Attia
- Eng. Kheiry Shehata
- Eng. Ramsis Bakhoum
- Eng. Fayek Abdel Sayed
- Eng. Essam Barakat

♦ OTHER MINISTRIES' REPRESENTATIVES

- Ministry of Agriculture and Land Reclamation (Eng. Helmi Eid, Dr. Fawzi Naiem, and Dr. Adel Abdel Moneim)
- Ministry of Housing, New Communities and Utilities (Eng. Fatma Osman)
- Ministry of Health and Population (Dr. Seham Hendi, Dr. Yehia Abdel Wahab)
- Ministry of Local Development
- Ministry of Interior (Colonel Adel Abdel Maguid)
- Ministry of Industry (Eng. Abdel Aziz El Qasaby)
- Ministry of Environmental Affairs (Dr. Ahmed Hamza)
- Ministry of Tourism (Eng. Abdel Moheimen Mohamed)
- Ministry of Transport (General Samir Tawfik)

♦ NON-GOVERNMENTAL ORGANIZATIONS

- National Society for Canal and Drain Maintenance (Dr. Soud El Khafif)
- National Society for Water Resources Protection (Mr. Abdel Rahman Shalaby)
- Egyptian Society for Land Science (Dr. Hassan Hamdy)

♦ FARMERS' REPRESENTATIVES

- Mr. Mohamed Abdel Maguid Osman
- Mr. Gamil Gawish
- Mrs. Hoda Nessim
- Mr. Mohamed Abdel Moneim Ismail
- Mr. Mohamed El-Ghamri Mahsoub

- Mr. Mohamed El-Fiki
- Mr. Ali Affifi Ahmed
- Mr. Wagih Aboul Eineen
- Mr. Mostafa Abdalla

♦ **PUBLIC PERSONALITIES AND UNIVERSITIES**

- Eng. Mostafa El Kadi
- Dr. Ibrahim Ali Hassan
- Dr. Mohamed El Mouttassem
- Dr. Mohamed Hassan Amer
- Dr. Abdel Wahab Amer
- Dr. Mohamed Mokhles Abou-Seida

♦ **USAID**

- Dr. Gary Ender
- Dr. Wadie Fahim

♦ **WPAU/EPIQ**

- Eng. Gamil Mahmoud
- Dr. Jeffrey Fredericks
- Eng. Sarwat Fahmy
- Eng. Mohamed Nasser Ezzat
- Dr. Ibrahim Elassiouty
- Eng. Ahmed Maher
- Eng. Yehia Abdel Aziz
- Mr. Adrian Hutchens
- Dr. Mohamed Badran
- Dr. Amr Moussa
- Mr. Greg Olson
- Mr. Mahmoud Sabra
- Mrs. Foaz El Mona
- Miss Randa Abdel Latif
- Miss Safaa El-Khodary

AGENDA

Revision of Law 12/1984 Stakeholder Workshop

The Nile Conference Room, Conrad International Hotel Cairo

Monday Nov. 6, 2000

9:00-9:30 AM	Opening Eng. Ali Morsi (Undersecretary MWRI and Chairman of Irrigation Department)
9:30-11:00 AM	Proposed changes of Law 12/1984 ♦ General Discussion
11:00-11:30 AM	**Coffee Break**
11:30 AM-1:30 PM	Proposed changes of Law 12/1984 (continued) ♦ General Discussion (continued)
1:30-2:30 PM	**Lunch**

ANALYSIS AND REVIEW OF MODIFICATIONS IN LAW 12 OF 1984 ON IRRIGATION AND DRAINAGE

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